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The Journal Needs Your Papers

This issue of the Journal is overdue. The publication has been delayed owing the slow wait for papers to accumulate sufficiently in number to begin production. Despite the availability of research funding facilities within the Group and the many research projects completed by staff members pursuing higher degrees papers have been slow in coming. Perhaps, it is time to encourage research and publications by rewarding hospitals and staff for research conducted, completed and published. Also, KPJ University College (KPJUC) should give the Journal a boost by submitting more of its research work for publication. Research and publication should give the KPJ brand that extra notch in comparison to others and this Journal should showcase these achievements.

The delay was exacerbated by the lack of editorial support to facilitate communication with authors with regard to revisions and resubmissions of articles. We hope to overcome these issues by transferring the main bulk of editorial work to KPJUC’s academic staff. The editorial board has been revamped to reflect this new working strategy. Submissions of articles can be made directly to the Editor at KPJ Damansara Specialist Hospital, Prof J Anbu Jeba Sunilson at KPJUC or Dr KV Anitha at KPJ Healthcare.

This issue presents articles addressing various aspects of healthcare. We are pleased to see more articles on quality and safety (Q&S) issues being submitted for publication. A lot of work has been done by hospitals in the Group to enhance Q&S in the delivery of healthcare and much research can be done hand in hand with the process of implementation of improvement strategies. Resulting publications will not only improve our knowledge of Q&S issues but also serve as reference points of our progress in our quality journey. Additionally, papers on laboratory studies, clinical experiences and ethical, religious and cultural aspects of vaccination reflect the spectrum of healthcare issues that can be brought to our readers to broaden our perspectives of healthcare delivery. Selected abstracts of papers from two previous conferences have also been included.

Finally, we hope to receive increasing support from contributors from all groups of healthcare providers from within the group as well as elsewhere. The Journal should continue to grow to reflect the achievements of KPJ Healthcare as a provider of healthcare services, education and training par excellence in this part of the world.

Azizi Haji Omar, MMedSc, FRCP, FAMM, FCCP
Development of Orodispersible Tablets of Salbutamol for Effective Management of Asthma

Abdullah Khan B. Pharm., M. Pharm., Ph.D., Qusro Hassan, B.Pharm., M.Pharm., and J. Anbu Jeba Sunilson B.Pharm., M.Pharm., Ph.D.

ABSTRACT

Introduction: Oral route is the most convenient and extensively used route of drug administration. Any dosage form which can be administered using oral route is practically considered to be the most acceptable dosage form. An oral dosage form which could overcome the common problems associated with oral route, such as dysphagia, would be the best choice particularly if it contributes to a faster therapeutic action.

Objective: The present study was aimed to develop orodispersible (ODT) tablets as a dosage form for salbutamol, a commonly prescribed anti asthmatic drug.

Methodology: Orodispersible tablets of salbutamol were prepared using different combinations of super disintegrants by direct compression method. The prepared tablets were evaluated for various quality parameters such as hardness, friability, weight variation, water absorption ratio, wetting time, drug content uniformity, in vitro dispersion and disintegration time, and in vitro drug release.

Results: All the prepared formulations showed good pharmaceutical properties. Formulation F3 containing 200mg of drug, and 2% each of crospovidone and sodium starch glycolate with other formulation excipients was found to be the best based on in vitro disintegration and dissolution time. The hardness of the formulation was found to be 2.8 ± 0.5, friability was less than 0.25%, disintegration time was 16±0.4 seconds, wetting time was 20 ±0.5 seconds and water absorption ratio was 71±0.6 %. The drug content uniformity and in vitro dissolution studies were carried out in pH 6.8 phosphate buffer using UV spectrophotometer at 277 nm. Drug content of the formulation was found to be 98 ±0.5% and 95 ±0.4% drug release was achieved within 15 minutes. Formulation F3 was assessed for drug excipient interaction and IR spectrum of the formulation suggested no chemical interaction.

Conclusion: From the study it can be concluded that orodispersible tablets of salbutamol can be prepared using crospovidone and sodium starch glycolate as super disintegrants and this should be further studied at large scale. Such a convenient dosage form will improve patient compliance and ensure better therapeutic outcome.

Keywords: Orodispersible tablets, crospovidone, sodium starch glycolate, in vitro

INTRODUCTION

An orodispersible drug delivery system is a patient friendly dosage form usually prepared in the form of a tablet that disintegrates and dissolves in the oral cavity and can be consumed without water. This is a most suitable dosage form for patients having difficulties in swallowing tablets and hard gelatin capsules and who therefore do not take medications as prescribed. An estimated 50% of the population is affected by this problem, which results in a high incidence of noncompliance and ineffective therapy. In some cases such as motion sickness, sudden episodes of allergic attacks or coughing and unavailability of water, swallowing conventional tablets may be difficult. Particularly the difficulty is experienced by pediatric and geriatric patients. Such problems can be resolved by means of fast disintegrating orodispersible tablets.

Salbutamol produces bronchodilator effects through its highly selective β2-adrenergic receptor stimulant action. The drug is used in various airway resistance diseases including chronic bronchitis, bronchospasm in bronchial asthma, emphysema, exercise induced bronchospams etc.
Due to hepatic first pass effect and extensive metabolism via intestinal sulfonation and colonic degradation the bioavailability of conventional oral dosage forms of salbutamol is only 44\%.\(^5\)

The bioavailability of salbutamol may be increased by administering orodispersible tablets which results in absorption of drug in oral cavity and pregastric absorption of saliva containing dispersed drug that passes down into the stomach. And also the amount of drug that is subjected to first-pass metabolism will be reduced as compared to conventional tablet.\(^5\)

Hence in the present study an attempt was made to develop orodispersible tablets of salbutamol sulphate using three super disintegrants viz., crospovidone, sodium starch glycolate, and cross carmellose sodium by direct compression technique. Due to faster disintegraton and ease of administration the orodispersible tablets of salbutamol is expected to improve bioavailability and patient compliance and will help to achieve the desired therapeutic outcome.

MATERIALS AND METHOD

Salbutamol was obtained as a gift sample from Micro Labs, Bangalore. Croscarmellose sodium, crospovidone, and sodium starch glycolate were procured from Signet Chemicals Mumbai. Lactose, Talc, Magnesium stereate was purchased from SD fine chemicals Mumbai. All other chemicals and reagents of analytical grades were used.

Standard Calibration Curve for Salbutamol Sulphate

Solutions of salbutamol ranging from 5 to 25mcg/ml were prepared in phosphate buffer 6.8 and absorbance was measured at 277nm using Shimadzu UV spectrophotometer 1700 and absorbance Vs concentration graph was plotted.

Preparation of Tablets

The orodispersible tablets were prepared by direct compression method according to the composition for each formulation as given in Table 1. All the ingredients were separately passed through sieve no. 60 Salbutamol and microcrystalline cellulose were mixed in small proportions to achieve uniform mixing. Other ingredients were then added in geometric order and compressed using Cadmach compression machine with a flat punch.

Evaluation of Tablets

Weight Variation

All the tablets prepared using a definite formula must have uniform weight and therefore it is essential to measure the weight variation of the prepared tablets. The weight variation of orodispersible tablets of salbutamol sulphate was measured. 20 tablets from each formulation were randomly selected and mean weight was calculated, and then all the tablets were individually weighed and compared with the mean weight of the 20 tablets. As per the limits not more than 2 tablets should be outside the percentage limits and no tablet should differ by more than 2 times the percentage limit

Frability

Friability is determined to know the strength of tablets to withstand wear and tear during packaging and transportation. Twenty tablets from each formulation were taken and their initial weights were determined. Then they were placed in the Roche friabilator adjusted at 25 revolutions per minute.\(^7\) The tablets were then de-dusted and reweighed and the percentage weight loss was calculated using the following formula:-

\[
\text{Percentage friability} = \frac{\text{initial weight} - \text{final weight}}{\text{initial weight}} \times 100
\]

Table 1 — Composition of different formulations of orodispersible tablets of salbutamol sulphate

<table>
<thead>
<tr>
<th>S.No</th>
<th>Ingredients (mg)</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
<th>F6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salbutamol</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>Lactose (mg) DC</td>
<td>7150</td>
<td>7150</td>
<td>7150</td>
<td>7150</td>
<td>7150</td>
<td>7150</td>
</tr>
<tr>
<td>3</td>
<td>Crospovidone (polyplosdone)</td>
<td>100</td>
<td>100</td>
<td>200</td>
<td>200</td>
<td>200</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Sodium starch glycolate (Explotab)</td>
<td>100</td>
<td>200</td>
<td>200</td>
<td>100</td>
<td>-</td>
<td>200</td>
</tr>
<tr>
<td>5</td>
<td>Croscarmillose sodium (AC-di-Sol)</td>
<td>200</td>
<td>100</td>
<td>-</td>
<td>100</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>6</td>
<td>Microcrystalline cellulose</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
<td>1700</td>
</tr>
<tr>
<td>7</td>
<td>Magnesium stearate</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>Talc</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Total Weight</td>
<td>10000</td>
<td>10000</td>
<td>10000</td>
<td>10000</td>
<td>10000</td>
<td>10000</td>
</tr>
</tbody>
</table>
Hardness

Hardness of the tablets is another measure of its strength. The hardness of the tablet was measured by using Pfizer hardness tester set at zero initial reading. Five tablets from each batch were taken and hardness was measured by placing the tablets between the two jaws of the hardness tester. The tablet breaking point (weight in kg) was determined by gradually increasing the force on the tablet. The mean of the breaking strength of five tablets was calculated.

Diameter and Thickness

The diameter and thickness tablets were determined using Vernier caliper. Five tablets from each formulation were used and the mean value was calculated.

Wetting Time

Wetting time of the tablet is the time by the tablet to disintegrate when kept motionless on a tissue paper in a petri dish filled with either water or simulated saliva. To simulate in vivo disintegration five tablets from each batch were separately placed on a piece of tissue paper folded twice, and the paper was placed in a small Petri dish containing 6 ml of simulated saliva pH 6.8, and the time for complete wetting was measured.

Uniformity of Content

Drug content uniformity is an important characteristic of any dosage form to ensure the labeled amount. Ten tablets from each formulation were randomly chosen. The content uniformity studies were carried out by crushing the tablets in buffer and determining the amount of drug present using UV spectroscopy.

In vitro Disintegration Time

In vitro disintegration time of tablets was carried out by using a disintegration test apparatus. Six tablets were individually placed in the tubes of the disintegration test apparatus in distilled water and the temperature was maintained at 37 ± 2°C. Time take for individual tablet to completely disintegrate was noted and mean reading was calculated.

Dissolution Study

In vitro dissolution studies were carried out using a USP type II apparatus at 50 rpm in 500 ml phosphate buffer solution pH 6.8, at 37 ± 0.5 °C temperature of dissolution medium. Aliquots of dissolution medium were withdrawn at specific time intervals and were filtered. Absorption of filtered solution was measured by UV spectroscopy at 277 nm and drug content was determined from a standard calibration curve. Dissolution rate was studied for six tablets from each formulation.

RESULTS AND DISCUSSION

Orodispersible tablets of salbutamol sulphate were prepared by direct compression method using combinations of super disintegrants, diluents and other formulation ingredients. The prepared formulations were evaluated for various formulation characteristics such as weight variation, friability, hardness, wetting time, drug content uniformity, and in vitro dissolution. All the formulations showed uniformity of weight as the variation was found to be within the pharmacopoeial limits of ±5%. The range of weight variation was found to be between 98-101%. Diameter and thickness of the prepared formulations were found to be between 6.89 to 6.95 mm and 1.99 to 2.20 mm respectively. Friability and hardness of the tablets were measured using Roche friabilator Pfizer hardness tester. Friability of the formulations was found to be between 0.19 to 0.25%, which well in the accepted limits and the hardness of the tablets was 2.5 to 3.0 Kg/cm² indicating that the prepared tablets have good mechanical strength. Tablet wetting time is one of the most important parameters for orodispersible tablets as it affects the dispersion of tablets. Wetting time of the prepared formulations was measured under undisturbed condition using simulated saliva to mimic the conditions of the oral cavity and it was found to be between 23 to 35 seconds. Disintegration time of the formulated tablets was found to be between 16-22 seconds. Faster disintegration of tablets is an essential parameter as it is the primary step for the tablet to dissolve. The lowered disintegrating time may be due to the increased water uptake and swelling “breaking” properties of the disintegrants the results of the evaluation parameters are depicted in Table No. 2. Finally the prepared tablets were subjected to in vitro dissolution studies to find out the percent drug

Table 2 — Evaluation of Orodispersible Tablets of Salbutamol Sulphate

<table>
<thead>
<tr>
<th>Formulation Code</th>
<th>Diameter (mm) Mean ±SD</th>
<th>Thickness (mm) Mean ±SD</th>
<th>Weight variation %</th>
<th>Friability %</th>
<th>Hardness kg/cm² Mean ±SD</th>
<th>Disintegration time (sec.) Mean ±SD</th>
<th>Drug content uniformity mg/tablet</th>
<th>Wetting time (sec.) Mean ±SD</th>
<th>Friability %</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>6.89±0.05</td>
<td>2.18±0.01</td>
<td>99.5±0.95</td>
<td>0.19%</td>
<td>2.5±0.64</td>
<td>27±0.12</td>
<td>1.96±0.04</td>
<td>16±1.5</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>6.96±0.04</td>
<td>2.20±0.01</td>
<td>100.18±0.85</td>
<td>0.25%</td>
<td>2.5±0.14</td>
<td>32±0.17</td>
<td>2.12±0.08</td>
<td>21±2.2</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>6.99±0.01</td>
<td>2.01±0.02</td>
<td>99.5±0.70</td>
<td>0.20%</td>
<td>2.5±0.08</td>
<td>23±0.04</td>
<td>1.99±0.01</td>
<td>16±0.4</td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>6.99±0.02</td>
<td>2.10±0.01</td>
<td>99.95±0.9</td>
<td>0.18%</td>
<td>2.8±0.11</td>
<td>26±0.11</td>
<td>2.06±0.04</td>
<td>18±1.7</td>
<td></td>
</tr>
<tr>
<td>F5</td>
<td>6.94±0.01</td>
<td>1.99±0.03</td>
<td>98.90±0.88</td>
<td>0.23%</td>
<td>3.0±0.22</td>
<td>27±0.21</td>
<td>1.96±0.04</td>
<td>21±1.8</td>
<td></td>
</tr>
<tr>
<td>F6</td>
<td>6.95±0.02</td>
<td>2.02±0.01</td>
<td>99.80±0.5</td>
<td>0.22%</td>
<td>2.7±0.27</td>
<td>27±0.24</td>
<td>1.98±0.06</td>
<td>17±1.2</td>
<td></td>
</tr>
</tbody>
</table>
release per unit time by comparing absorbance with the standard graph of salbutamol sulphate (Fig. 1). It was observed that at least 95% of the drug was released from all the formulations within 15 min. which can be said to be appropriate for faster absorption of drug. Percentage drug release Vs time is graphically presented in Fig. 2.

CONCLUSION

From the present studies it can concluded that orodispersible tablets of salbutamol can be successfully prepared using combinations of super disintegrants and other common tablet excipient. And considering the disintegration rate of dissolution therapeutically more effective formulation can be developed and the distinct properties of orodispersible tablets it is certain that it will improve patient compliance and help to achieve desired therapeutic effects and effective management of asthma. Considering the various tablet characteristics it may be concluded that formulation F3 was the best among all the prepared formulations. However there is a need to prepare such a formulation at large scale and subjected to in vivo studies.

REFERENCES

6 Abdullah Khan et al.


Novel 1,4-benzothiazine Derivatives as Antimicrobial Agents: Synthesis, Characterization and Evaluation

K. Anandarajagopal, B.Pharm, M.Pharm

ABSTRACT
Introduction: Despite the increase in microbial infections, therapeutic options are very limited and are often unsatisfactory because of high toxicity and an inability to eradicate infections. The chemistry of heterocyclic compounds has been an interesting field for the development new medicinal compounds with high therapeutic activity and lesser side effects. Different classes of benzothiazine compounds possess an extensive spectrum of pharmacological activities such as analgesic, anti-inflammatory, anticonvulsant, antiulcer, anticancer, antibacterial and antifungal activities. The multifarious applications of 1,4-benzothiazine have concentrating medicinal chemists to synthesize novel 1,4-benzothiazine derivatives with potential therapeutic action.

Objective: In view of this, the present study was an attempt to synthesize novel 1,4-benzothiazine derivatives and evaluate them for their antibacterial and antifungal properties.

Methods: 3-substituted benzylideno hydrazino 2(2H)-1,4-benzothiazines (C1 – C4) were synthesized by refluxing the respective ketones and 3-hydrazino benzothiazine which was obtained by the reaction between 1,4-benzothiazine-3-(2H)-one and hydrazine hydrate in methanol. 1,4-benzothiazine-3-(2H)-one was prepared by oxidative cyclization of 2-amino thiophenol with ethyl chloroacetate.

Results: The synthesized compounds were confirmed by melting point and TLC. Their structure was established by various analytical techniques such as IR and 1HNMR spectral studies. All the newly synthesized compounds exhibited moderate to good antibacterial and antifungal activities against the selected microorganisms.

Conclusion: The present investigations suggest that the experimental procedures make this methodology a mode of choice for the synthesis of title compounds as good antimicrobial agents. KPJ Medical Journal 2016; 6:7–10

Keywords: Benzothiazine, cycloaddition; hydrazine; ketones; antibacterial; antifungal

INTRODUCTION

Medicinal chemistry has seen a great deal of success in understanding relationship with chemical structure and its biological activity. Hetero-aromatic compounds have attracted considerable attention in the design of biologically active molecules and advanced organic materials. The exploitation of a simple molecule with different functionalities for the synthesis of heterocyclic compounds is a worthwhile contribution in the chemistry of heterocycles. The derivatives of heterocyclic compounds have their own importance due to the good biological activities. Among the wide variety of heterocycles, the compounds bearing nitrogen atom and sulphur atom as hetero atom have played an important role in medicinal chemistry. The thiazine ring system, a versatile lead molecule in pharmaceutical development, is a six-membered heterocyclic ring and composed of one nitrogen atom and one sulphur atom. In recent years, extensive studies have been focused on 1,4-benzothiazine derivatives because of their diverse chemical reactivity, accessibility and wide range of biological activities. At literature survey reveals that benzothiazine derivatives are well known to have antibacterial, antifungal, anti-malarial, antiviral activities. These observations lead to this present work on the synthesis of a series of novel 1,4-benzothiazine derivatives and testing for their antimicrobial activity.

MATERIALS AND METHODS

General

Thin Layer Chromatography using Silica gel-G as stationary phase and Benzene-Water (9:1) as eluent was used to check the purity of the compounds and the spots were visually detected in an Iodine chamber. Melting points were determined by open-ended capillary tube on Veego electrical melting point apparatus and were uncorrected. IR spectra in $\nu_{\text{max}}$ (cm$^{-1}$) on FT-IR (Shizmadu-8400 series) using KBr disc technique and $^1$H NMR spectra in $\delta$ units (ppm) relative to an internal standard of tetramethylsilane on $^1$H NMR (Bruker 400 MHz) in DMSO-d$_6$ were used to elucidate the structure.
K. Anandarajagopal

of the synthesized compounds. Fig. 1 depicts the synthetic method for the title compounds. Starting materials and reagents used were laboratory grade and procured from commercial suppliers.

**Experimental procedure for the synthesis of novel 3-substituted benzylideno hydrazino 2(\textit{H})-1,4-benzothiazines (C1-C4)**

The title compounds, novel 3-substituted benzylideno hydrazine-2(\textit{H})-1,4-benzothiazines were synthesized\(^7\) in three steps. The % yield, melting point (ºC) and \(R_f\) value were tabulated in Table 1.

**Step I: Synthesis of 1,4-benzothiazine-3-(2\textit{H})-one**

Equimolar quantities (0.028mol) of a mixture of 2-amino thio phenol and ethyl chloro acetate in 33% NaOH were taken and refluxed on a steam bath for 5 h. The reaction mixture was then cooled and filtered. The filtrate was neutralized with dilute HCl, and the precipitate of 1,4-benzothiazine-3-(2\textit{H})-one (A) separated out was washed with water and crystallized from 60% ethanol.

**Step II: Synthesis of 3-hydrazino-1\textit{H}-1,4-benzothiazine**

Equimolar quantities (0.0041mol) of a mixture of 1,4-benzothiazine-3-(2\textit{H})-one and hydrazine hydrate

![Fig. 1. Schematic diagram for the synthesis of novel 3-substituted benzylideno hydrazino 2(\textit{H})-1,4-benzothiazines (C1-C4)](image)

<table>
<thead>
<tr>
<th>Comp. code</th>
<th>(R)</th>
<th>(R^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>-H</td>
<td>(-C_6H_{12}NO_2)</td>
</tr>
<tr>
<td>C2</td>
<td>(-C_6H_5)</td>
<td>(-C_6H_5)</td>
</tr>
<tr>
<td>C3</td>
<td>-H</td>
<td>(-C_6H_4CH_3)</td>
</tr>
<tr>
<td></td>
<td>(-C_5H_4N)</td>
<td>(-\text{NHNH}_2)</td>
</tr>
</tbody>
</table>

**Table 1 — Physical characterization of 3-substituted benzylideno hydrazino 2(\textit{H})-1,4-benzothiazines**

<table>
<thead>
<tr>
<th>Compound code</th>
<th>Molecular formula</th>
<th>Molecular weight</th>
<th>% yield</th>
<th>m.p. (ºC)</th>
<th>(R_f) value</th>
<th>log P</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>(C_9H_{12}O_2N_4S)</td>
<td>312.34</td>
<td>65.97</td>
<td>153-154</td>
<td>0.478</td>
<td>2.71</td>
</tr>
<tr>
<td>C2</td>
<td>(C_{10}H_{17}N_3S)</td>
<td>343.11</td>
<td>86.70</td>
<td>118-120</td>
<td>0.650</td>
<td>5.06</td>
</tr>
<tr>
<td>C3</td>
<td>(C_9H_{17}N_3S)</td>
<td>281.36</td>
<td>70.06</td>
<td>108-110</td>
<td>0.568</td>
<td>4.09</td>
</tr>
<tr>
<td>C4</td>
<td>(C_{14}H_{14}N_6S)</td>
<td>298.10</td>
<td>55.21</td>
<td>101-104</td>
<td>0.184</td>
<td>1.41</td>
</tr>
</tbody>
</table>
(80%) in methanol were taken and heated on a steam bath for 2 h. The reaction mixture was then concentrated and cooled to get crystalline product of 3-hydrazino-1H-1,4-benzothiazine (B).

Step III: 3-substituted benzylideno hydrazino 2(H)-1,4-benzothiazines

Equimolar quantities (0.00055mol) of a mixture of 3-hydrazino-1H-1,4-benzothiazine and respective carbonyl compound in acetic acid were taken and dissolved in ethanol. Then the mixture was refluxed on a steam bath for 4-5 h. The reaction mixture was then concentrated and cooled to get the crystalline product of 3-substituted benzylideno hydrazino 2(H)-1,4-benzothiazines (C1 – C4).

Molecular and Drug-Likeness property

The prediction of molecular and drug-likeness properties by Lipinski’s “Rule of 5” is one of the tools to envisage oral bioavailability. The rule states, that most “drug-like” molecules have logP ≤ 5, molecular weight ≤ 500, number of rotatable bonds ≤ 10, number of H bond acceptors ≤ 10, and number of H bond donors’ ≤ 5. Molecules violating more than one of these rules may have problems with bioavailability. The log P value of the synthesized compounds was determined using n-octanol-water system. The molecular weight and the log P value of the title compounds were recorded in Table 1.

Evaluation of Anti-Microbial Activity

Microorganisms used

G (+ve) bacteria such as Bacillus subtilis, Staphylococcus aureus, Streptococcus pyogenes, G (-ve) bacteria such as Escherichia coli, Proteus mirabilis, Klebsiella aerogenes and fungus such as Candida albicans and Candida tropicalis were used for this study.

Anti-microbial activity

The antimicrobial activity was performed by cup-plate method.6 The protocol has been approved by KPJ Healthcare University Research and Ethics Committees. All the synthesized compounds were dissolved in distilled water at a concentration of 30mcg/mL. Muller-Hinton agar medium and Sabouraud dextrose agar medium were used for antibacterial and antifungal activity respectively. The respective microbial culture was spread (swabbed) into the nutrient agar plates for uniform distribution of colonies. Using a sterile cork borer, 8 mm wide well was made on each agar plates. All the synthesized compounds (30mcg/mL) were poured into each well using a sterile micropipette. The plates were incubated for 24 h at 37°C and 48 h at 27°C for antibacterial and antifungal activity respectively. After incubation, the diameter (mm) of zone of inhibition was measured to assess the antimicrobial activity.

Chloramphenicol (30mcg/ml) and Fluconazole (30mcg/ml) were used as standard for antibacterial and antifungal activity respectively. All the experiments were triplicate. The results were tabulated in Table 2.

<table>
<thead>
<tr>
<th>Table 2 — Antimicrobial activity of 3-substituted benzylideno hydrazino 2(H)-1,4-benzothiazines</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Compound code</strong></td>
</tr>
<tr>
<td>C1</td>
</tr>
<tr>
<td>C2</td>
</tr>
<tr>
<td>C3</td>
</tr>
</tbody>
</table>

Fig. 2. Antimicrobial activity of 3-substituted benzylideno hydrazino 2(H)-1,4-benzothiazines
Statistical analysis

All the results were expressed as mean ± SEM. The values obtained for the above parameters in synthesized compounds were compared with control group using One-Way ANOVA followed by students “t” test [16]. The values of P < 0.05 and P < 0.01 were considered to indicate a significant difference between the groups.

RESULTS

The present work described the synthesis of a series of some novel 3-substituted benzylideno hydrazine 2(H)-1,4-benzothiazines with good yield. The melting points and Rf value by TLC indicated the formation of new chemical entities. The structure of the synthesized compounds was established by IR and 1H-NMR spectral data. Based on the molecular and drug-likeness properties, all the newly synthesized 1,4-benzothiazines possess good bioavailability. The compound C1 exhibited high significant (p<0.01) antibacterial and antifungal activities followed by compound C3 (p<0.01), compound C4 (p<0.05) and compound C2. (Table 2 and Fig. 2)

DISCUSSION

The presence of NH band (3326 – 3294 cm⁻¹) and NH proton signal (4.56 - 4.72 ppm) in IR and 1H NMR spectrum respectively were noted in all the newly synthesized compounds. The presence of >C=N-stretching (1638 - 1754 cm⁻¹) was also noted in IR spectrum. All these data confirmed the formation of the novel chemical entities.

The synthesized compounds’ log P value (< 5) and the molecular weight (≤ 500) supported that all the newly synthesized compounds have molecular and drug-likeness properties (Table 1). Based on the prediction of molecular and drug-likeness properties, the synthesized title compounds did not violate Lipinski’s “Rule of 5” and had good bioavailability.

The compound C1 exhibited highly significant (p<0.01) antibacterial and antifungal activities which might be due to the presence of less bulky substitution (R₁ = H) while compound C2 had high bulky substitution (R₁ = C₆H₅) devoid of good antibacterial and antifungal activities against the selected microorganisms.

CONCLUSION

As a conclusion, this synthetic methodology is the better mode for the synthesis of title compounds and exhibited molecular and drug-likeness property and directs to predict the possible mechanism of action of title compounds. Therefore the title compounds may serve as a lead molecule for further modification to obtain clinically useful novel antimicrobial entities.

REFERENCES

Hepatoprotective Activity of Isolated Gossypin, a Novel Bioflavanoid from Thespesia Populnea Linn

J. Anbu Jeba Sunilson, B.Pharm, M.Pharm, Ph.D, FIC, FRHS1, 2

ABSTRACT

Introduction: Hepatitis is one of the liver disorders associated with jaundice and prevalent diseases in the world. It is essential to develop new effective drugs to minimize the injury to the liver. Medicinal plants play a vital role in the management of various liver disorders along with other system associated diseases. Thespesia populnea (Family: Malvaceae) is a medicinal plant which has been used to treat several ailments in the Ayurvedic medical system. It is traditionally used to treat jaundice by the tribes in west Bengal, India.

Objective: The present study was aimed to extract T. populnea flower using suitable solvents and evaluate hepatoprotective activity in CCl4 induced hepatotoxic rats to scientifically prove the traditional claim about T. populnea flower and to fractionate the pharmacologically active extract. It was also aimed to isolate the active constituent from the soluble fraction and to evaluate the hepatoprotective activity and elucidate the structure of the isolated compound.

Methods: T. populnea flower was successively extracted with petroleum ether, chloroform, alcohol and water by cold maceration technique for 6 days. All the extracts (200mg/kg b.wt. p.o.) were evaluated for their hepatoprotective activity in CCl4 induced hepatotoxic rats. The hepatoprotective alcohol extract was fractionated using n-hexane, ethyl acetate and n-butanol and the fractions (200 and 400mg/kg b.wt. p.o.) were evaluated for hepatoprotective activity in CCl4 induced hepatotoxic rats. The hepatoprotective ethyl acetate soluble fraction (100gm) was subjected to column chromatography using silica gel (60-120 mesh size) as an adsorbent. Benzene was used to build up the column. The polarity of the mobile phase was gradually changed to elute the active constituent and established for its structure. The isolated compound (100 and 200mg/kg b.wt. p.o.) was further evaluated for its acute toxicity and hepatoprotective effect against CCl4 induced hepatotoxicity. Biochemical analysis and Histopathology have been performed. Hepatotoxic rats were orally treated with extracts, fractions and the isolated compound for 7 days. Silymarin (100mg/kg) was used as standard drug.

Results: Among all the extracts and fractions, alcohol extract of T. populnea (200mg/kg) and its ethyl acetate soluble fraction (200mg/kg and 400mg/kg) showed significant hepatoprotective effect. Column Chromatography using methanol: ethyl acetate (1:9), a yellow crystalline compound eluted out which gave a positive reaction for flavanoid glycoside which was confirmed as gossypin by melting point and spectral data such as UV, IR, 1H-NMR and Mass spectrum. This was further confirmed by comparison with the marker compound gossypin by mixed melting point, Co-TLC and Co-HPTLC. The isolated compound showed no mortality or toxic symptoms upto 1g/kg b.wt. orally. Oral administration of isolated gossypin (100 and 200mg/kg b.wt) exhibited the potent hepatoprotective effect against CCl4 induced hepatotoxicity, as evident by the significant restoration in the biochemical parameters such as SGOT, SGPT, alkaline phosphate, cholesterol, total protein, albumin, total bilirubin and direct bilirubin. Histopathological examination also supported the hepatoprotective effect. These results were very much comparable to the standard hepatoprotective agent, silymarin 100mg/kg.

Conclusion: The present study reveals the scientific evidence in order to support its traditional use in liver diseases and concludes that gossypin was isolated from T. populnea flower for the first time and found to be promising hepatoprotective agent from natural source.

Keywords: Thespesia populnea, Hepatoprotective, Gossypin, CCl4 induced hepatotoxicity, Biochemical analysis

INTRODUCTION

Medicinal plants are known to play a vital role in the treatment of human ailments. Extracts from medicinal plants are commonly employed to treat a wide variety of diseases in the traditional medicine. Recently researchers focused on herbal drugs for scientific
validation of their efficacy. Liver diseases are one of the most serious ailments, mainly caused by excess consumption of alcohol, high doses of paracetamol, inhalation or ingestion of toxic chemicals such as carbon tetrachloride, chemotherapeutic agents, peroxidised oil, etc.

In recent years, there is a tremendous scientific advancement in the field of hepatology. Jaundice and hepatitis are two major hepatic disorders that account for a high death rate. Therefore, searching for effective and safe herbal drugs for the treatment of liver disorders is important for the researchers.

*Thespesia populnea* soland ex correa (Family: Malvaceae) is a large tree found in Asian tropics and Pacific and Indian coastal forests and also cultivated in the gardens. It is commonly known as Indian tulip tree or Pacific rose wood in English; Puvarasam in Tamil and Bebaru or Baru Baru in Malay. The plant is traditionally used to treat cutaneous infections such as scabies, psoriasis, ringworm, guinea worm, eczema and herpetic diseases. The ground bark of the tree in coconut oil is boiled and externally applied to treat psoriasis and scabies. An ayurvedic formulation, panchvalkala contains *T. populnea* possess free radical scavenging activity. The literature survey reveals that *T. populnea* bark extracts exhibits antidiabetic hepatoprotective, anti-psoriatic and chemopreventive and antilipidperoxidative activities; flower extracts showed antibacterial activity; leaves possess wound healing property. Gossypol, a compound was found in *T. populnea* producing anti-fertility effect. The flowers of *T. populnea* are traditionally used to treat various liver disorders including hepatitis and jaundice by the tribes of West Bengal, India. There was no scientific evidence for the hepatoprotective activity of *T. populnea* flowers. These observations directed the present scientific investigation to evaluate the traditional claim about *T. populnea* flowers as hepatoprotective medicine and to isolate the active hepatoprotective compound.

**MATERIALS AND METHODS**

**Plant material**

The *T. populnea* flowers were collected from Port Dickson, Negeri Sembilan, Malaysia in the month of July 2012 and identified by Pharmacognosist, at KPJ Healthcare University College, Kota Seriemas, Nilai, Negeri Sembilan, Malaysia. A voucher specimen was deposited at School of Pharmacy, KPJUC/SP/HP12/17C.

**Preparation of extracts**

*T. populnea* flowers were washed thoroughly with water and shade dried (Fig.1). The dried flowers (1 kg) were ground into coarse powder. The powder was divided into four equal portions and macerated with suitable solvents such as Petroleum ether, chloroform, ethanol and distilled water at room temperature for 6 days. Then the extracts were filtered and concentrated using rotary vacuum evaporator under reduced pressure. The color, consistency and % yield of the extracts of *T. populnea* flowers were noted in Table 1.
Preliminary photochemical study

All the extracts of *T. populnea* flowers were subjected to preliminary phytochemical analysis to determine the phytoconstituents which might be responsible for hepatoprotective activity. The phytochemical test was carried out for all the extracts to establish the phytoconstituents such as alkaloids, carbohydrates and glycosides, amino acids and proteins, fixed oils and fats, phenolic compounds and tannins, triterpenoids, saponins, gums and mucilage, flavones and flavonones by standard methods.13

Fractionation of the extract

The crude active hepatoprotective extract was further fractionated by successive solvent extraction with n-hexane, ethyl acetate and n-butanol.14 Each fraction was collected separately and concentrated using rotary vacuum evaporator under reduced pressure.

Isolation and structural elucidation of bioactive compound

The active hepatoprotective active ethyl acetate soluble fraction (100gm) was subjected to column chromatography using silica gel (60-120 mesh size) as an adsorbent. Benzene was used to build up the column. The polarity of the mobile phase was gradually changed to elute the active constituent. The isolated compound was confirmed by melting point and the structure was elucidated by various spectral data such as UV, IR, \(^1\)H-NMR and Mass spectrum. This was further confirmed by comparing with the marker compound by mixed melting point, Co-TLC and Co-HPTLC.15

Animals

Healthy adult albino mice and albino rats were procured from animal house, UPM, Malaysia and housed in groups of six animals, in standard cages, at room temperature (25 ± 3 °C), with 12 h dark/12 h light cycles, and food and water *ad libitum*. The animals weighing 150 - 200 g, were used for the experiment. Twelve hours prior to the experiments they were transferred to the laboratory and given only water *ad libitum*. The protocol was approved by KPJ Healthcare University Research and Ethical Committee.

### Table 1 — Percentage of yield, colour and consistency of *T. populnea* flower extracts

<table>
<thead>
<tr>
<th>Extract(s)</th>
<th>Colour</th>
<th>Consistency</th>
<th>% yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pet. ether</td>
<td>Dark brown</td>
<td>Sticky</td>
<td>3.88</td>
</tr>
<tr>
<td>Chloroform</td>
<td>Reddish brown</td>
<td>Sticky</td>
<td>9.42</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Greenish yellow</td>
<td>Semisolid</td>
<td>18.26</td>
</tr>
<tr>
<td>Aqueous</td>
<td>Yellowish brown</td>
<td>Solid</td>
<td>27.64</td>
</tr>
</tbody>
</table>

Acute toxicity studies

Acute toxicity studies were carried out on albino mice as per the guidelines (No. 423) given by the Organisation for Economic Co-operation and Development (OECD, 2001), Paris. The animals were fasted overnight prior to the acute experimental procedure. Pet. ether, chloroform, ethanol and aqueous extracts of *T. populnea* flowers were suspended in CMC separately. The extracts were administered separately to all the three animals in each group at a starting single dose of 5 mg/kg. The animals were observed continuously for signs of intoxication, lethargy, behavioral modification and morbidity for a period of 2 hours, then occasionally for 4 hours for severity of any toxic signs and mortality. When no mortality was observed the same dose was additionally administered to one more animal for each group. As no mortality was observed at this dose, the same procedure was repeated for dose levels of 50, 500, 1000 and 2000 mg/kg of extracts on separate newer groups. The LD<sub>50</sub> was thus determined and 1/10<sup>th</sup> of LD<sub>50</sub> value was taken as ED<sub>50</sub> value for the present study. The animals were kept under observation up to 14 days after drug administration to find out any delayed mortality.16 The same procedure was followed to find out the acute toxicity studies of fractions and isolated compound.

Evaluation of hepatoprotective activity

Carbon tetrachloride (CCl<sub>4</sub>) was used to induce hepatotoxicity in the selected animals. All the extracts (200mg/kg b.wt. *p.o.*), fractions of hepatoprotective active extract (200 and 400mg/kg b.wt. *p.o.*) and the isolated compound (100 and 200mg/kg b.wt. *p.o.*) from the active hepatoprotective fraction were evaluated for their hepatoprotective activity in CCl<sub>4</sub> induced hepatotoxic rats for 7 days. Silymarin (100mg/kg b.wt.) was used as standard drug. The extracts, fractions, isolated compound and silymarin were administered by oral route.17

Experimental design

Hepatoprotective activity of various extracts of *T. populnea* flowers

42 albino rats were taken and equally distributed into 6 groups. Group 1 served as solvent control and received 0.5 ml of normal saline. A single dose of CCl<sub>4</sub> (2 ml/kg b.wt. *i.p.*) was administered into Group 2 which served as hepatotoxic control. Group 3 – 7 were administered a single dose of CCl<sub>4</sub> (2 ml/kg b.wt. *i.p.*) on the first day and received pet. Ether extract, chloroform extract, ethanol extract, aqueous extract of *T. populnea* (400 mg/kg b.wt.) and standard drug, silymarin (100mg/kg b.wt.) respectively for 7 days.
Hepatoprotective activity of various fractions of active hepatoprotective extract of *T. populnea* flowers

54 albino rats were taken and equally distributed into 6 groups. Group 1 served as solvent control and received 0.5 ml of normal saline. A single dose of CCl4 (2 ml/kg b.wt. i.p.) was administered into Group 2 which served as hepatotoxic control. Group 3 – 9 were administered a single dose of CCl4 (2 ml/kg b.wt. i.p.) on the first day and received n-hexane fraction, ethyl acetate fraction and n-butanol fraction (200 and 400 mg/kg b.wt. p.o.) of active hepatoprotective extract of *T. populnea* and standard drug, silymarin (100mg/kg b.wt.) respectively for 7 days.

Hepatoprotective activity of isolated compound from hepatoprotective fraction of *T. populnea* flowers

30 albino rats were taken and equally distributed into 6 groups. Group 1 served as solvent control and received 0.5 ml of normal saline. A single dose of CCl4 (2 ml/kg b.wt. i.p.) was administered into Group 2 which served as hepatotoxic control. Group 3 – 5 were administered a single dose of CCl4 (2 ml/kg b.wt. i.p.) on the first day and received the isolated compound (100 and 200mg/kg b.wt. p.o.) from active hepatoprotective fraction of *T. populnea* and standard drug, silymarin (100mg/kg b.wt.) respectively for 7 days.

Biochemical analysis

On the seventh day treatment, the blood samples of each animal were separately collected by orbital sinus puncture under mild ether anesthesia in Eppendorf’s tubes (1 ml) containing 50 μl of anticoagulant (10% trisodium citrate) and plasma was separated by centrifuging at 6000 rpm for 15 min. The serum was used to analyze serum biochemical parameters, aspartate amino transaminase (ASAT), alanine amino transaminase (ALAT), alkaline phosphatase (ALP), lactate dehydrogenase (LDH), cholesterol (TC), albumin, total protein (TP), direct bilirubin (DB) and total bilirubin (TB). Standard assay kits were used to estimate the serum biochemical parameters.18

Statistical analysis

Data are expressed as Mean ± S.E.M. and subjected to one way ANOVA followed by Dunnet’s t-test. Values of \( P<0.01 \) and \( P<0.001 \) were considered statistically significant.18

Histopathological studies

A portion of the liver samples were used for histopathological studies, as per the standard procedure. 10% neutral phosphate buffer formalin and the hydrated tissue sections were used for the histological examination. Liver pieces of 5 μm in thickness were fixed and were stained with hematoxylin and eosin. The sections were examined under light microscope.18

RESULTS AND DISCUSSION

The colour, consistency, and percentage yield of *T. populnea* flowers extracts are tabulated in Table 1. Among the four extracts, aqueous extract had the highest percentage yield which was justified by 27.64% whereas pet. extract had the lowest percentage yield, 3.88% %. The phytochemical test revealed that the extracts of *T. populnea* flowers may contain phenolic compounds and tannins, saponins, triterpenoids, flavonoids, gums and mucilage. In acute toxicity studies, the oral administration of the extracts of *T. populnea* flowers did not produce any mortality in mice up to a dose level of 2000 mg/kg. This may be due to non-toxic therapeutic index of this plant. So the dose of the extracts was fixed at 200 mg/kg, i.e. 1/10th of the maximum tolerated dose.

In the present study, following a challenge of CCl4 toxicant a marked elevation was observed with regard to the serum levels of the enzymes aspartate aminotransferase (ASAT), alanine amino transferase (ALAT), alkaline phosphatase (ALP) and lactate dehydrogenase (LDH). A marked elevation was also observed in serum bilirubin levels. The total cholesterol (TC), total protein (TP) and albumin levels were significantly decreased. Among all the extracts and fractions, oral administration of ethanol extract of *T. populnea* (200mg/kg) and its ethyl acetate soluble fraction (200mg/kg and 400mg/kg) showed significant hepatoprotective effect as the altered levels were significantly restored towards the normal levels (Table 2 and 3).

Using column chromatography using methanol: ethyl acetate (1:9), a yellow colour fraction was eluted out and concentrated under vacuum that produced bright yellow color needle shaped crystalline compound. The isolated compound showed a positive colour reaction for flavanoid glycoside which was confirmed as gossypin by melting point (228 to 230°C) and spectral data such as UV, IR, 1H-NMR and Mass spectrum.

The isolated compound showed no mortality or toxic symptoms up to 1g/kg b.wt. orally. The oral administration of isolated gossypin (100 and 200mg/kg b.wt) exhibited the potent hepatoprotective effect against CCl4 induced hepatotoxicity, as evident by the significant restoration of biochemical parameters such as SGOT, SGPT, alkaline phosphatase, cholesterol, total protein, albumin, total bilirubin and direct bilirubin (Table 4). All the histopathological findings were comparable with the biochemical estimations (Fig. 2). These findings suggest that ethanol extract of *T. populnea* at a dose of 400 mg/kg bodyweight possess maximum activity against hepatitis.
Table 2 — The effects of various extracts of *T. populnea* on the biochemical parameters in serum of CCl₄ intoxicated rats

<table>
<thead>
<tr>
<th>Treatment (mg/kg)</th>
<th>ASAT U/l</th>
<th>ALAT U/l</th>
<th>ALP U/l</th>
<th>LDH U/l</th>
<th>TC mg/dl</th>
<th>Total Protein g/l</th>
<th>Albumin g/l</th>
<th>Total Bilirubin mg/dl</th>
<th>Direct Bilirubin mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>75.4 ± 0.74</td>
<td>53.4 ± 0.56</td>
<td>354.12 ± 1.98</td>
<td>398.44 ± 2.12</td>
<td>81.62 ± 0.64</td>
<td>8.62 ± 0.18</td>
<td>4.84 ± 0.28</td>
<td>0.56 ± 0.004</td>
<td>0.422 ± 0.007</td>
</tr>
<tr>
<td>CCl⁴ (2ml)</td>
<td>536.82aaa ± 3.06</td>
<td>406.20aaa ± 2.94</td>
<td>514.12aaa ± 1.78</td>
<td>622.24aaa ± 3.54</td>
<td>47.26aaa ± 1.02</td>
<td>6.02aaa ± 0.58</td>
<td>2.34aaa ± 0.08</td>
<td>3.64aaa ± 0.03</td>
<td>1.96aaa ± 0.06</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + n-hexane (400)</td>
<td>464.12 ± 6.34</td>
<td>328.26 ± 4.14</td>
<td>490.06 ± 3.74</td>
<td>552.32 ± 1.78</td>
<td>38.18 ± 1.02</td>
<td>5.66 ± 0.64</td>
<td>2.34 ± 0.08</td>
<td>3.26 ± 0.05</td>
<td>1.56 ± 0.06</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + chloroform (400)</td>
<td>442.66 ± 1.12</td>
<td>320.38 ± 1.68</td>
<td>454.82 ± 2.12</td>
<td>575.42 ± 3.02</td>
<td>41.12 ± 0.92</td>
<td>5.88 ± 1.72</td>
<td>2.48 ± 0.03</td>
<td>3.48 ± 0.04</td>
<td>1.68 ± 0.02</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + ethanol ext (400)</td>
<td>71.32bbb ± 1.28</td>
<td>50.32bbb ± 1.06</td>
<td>366.22bbb ± 3.42</td>
<td>376.24bbb ± 1.94</td>
<td>74.68bbb ± 0.68</td>
<td>7.46bbb ± 0.52</td>
<td>3.62bbb ± 0.07</td>
<td>0.48bbb ± 0.007</td>
<td>0.32bbb ± 0.003</td>
</tr>
<tr>
<td>Silymarin (100)</td>
<td>73.62bbb ± 1.61</td>
<td>50.88bbb ± 1.82</td>
<td>348.48bbb ± 3.72</td>
<td>374.62bbb ± 1.84</td>
<td>78.21bbb ± 0.37</td>
<td>8.0bbb ± 0.09</td>
<td>4.52bbb ± 0.13</td>
<td>0.54bbb ± 0.02</td>
<td>0.391bbb ± 0.004</td>
</tr>
</tbody>
</table>

Values are mean ± S.E.M.; n = 6; *P<0.05, **P<0.01, ***P<0.001, CCl₄ Vs control; bP<0.05, bbP<0.01, bbbP<0.001, extract treated groups Vs CCl₄

Table 3 — The effects of various fractions of ethanol extract of *T. populnea* on the biochemical parameters in serum of CCl₄ intoxicated rats

<table>
<thead>
<tr>
<th>Treatment (mg/kg)</th>
<th>ASAT U/l</th>
<th>ALAT U/l</th>
<th>ALP U/l</th>
<th>LDH U/l</th>
<th>TC mg/dl</th>
<th>Total Protein g/l</th>
<th>Albumin g/l</th>
<th>Total Bilirubin mg/dl</th>
<th>Direct Bilirubin mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>71.43 ± 1.21</td>
<td>49.22 ± 1.06</td>
<td>332.54 ± 3.84</td>
<td>361.23 ± 2.92</td>
<td>76.15 ± 1.42</td>
<td>8.15 ± 0.26</td>
<td>4.34 ± 0.19</td>
<td>0.44 ± 0.003</td>
<td>0.39 ± 0.005</td>
</tr>
<tr>
<td>CCl⁴ (2ml)</td>
<td>561.71aaa ± 4.12</td>
<td>430.51aaa ± 3.21</td>
<td>536.44aaa ± 2.19</td>
<td>645.77aaa ± 3.98</td>
<td>52.56aaa ± 1.75</td>
<td>6.81aaa ± 0.92</td>
<td>2.78aaa ± 0.82</td>
<td>4.12aaa ± 0.02</td>
<td>2.08aaa ± 0.07</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + n-hexane fraction (200)</td>
<td>481.53 ± 5.38</td>
<td>335.54 ± 4.97</td>
<td>508.92 ± 4.02</td>
<td>571.54 ± 2.46</td>
<td>42.76 ± 1.14</td>
<td>6.76 ± 0.72</td>
<td>2.72 ± 0.12</td>
<td>3.54 ± 0.04</td>
<td>1.73 ± 0.08</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + n-hexane fraction (400)</td>
<td>475.52 ± 1.47</td>
<td>327.21 ± 1.55</td>
<td>485.17 ± 2.54</td>
<td>552.33 ± 3.13</td>
<td>39.27 ± 1.12</td>
<td>6.83 ± 1.48</td>
<td>2.81 ± 0.04</td>
<td>3.07 ± 0.05</td>
<td>1.26 ± 0.03</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + ethyl acetate fraction (200)</td>
<td>75.11bb ± 1.59</td>
<td>71.71b ± 1.91</td>
<td>402.52b ± 2.73</td>
<td>431.16b ± 3.38</td>
<td>79.24bbb ± 1.58</td>
<td>6.98b ± 1.61</td>
<td>3.17bb ± 0.07</td>
<td>1.04b ± 0.03</td>
<td>1.52b ± 0.02</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + ethyl acetate fraction (400)</td>
<td>73.67bhb ± 1.57</td>
<td>52.66hb ± 1.14</td>
<td>358.14hb ± 3.75</td>
<td>388.13hb ± 2.28</td>
<td>79.22hb ± 1.11</td>
<td>7.57hb ± 1.04</td>
<td>3.71hb ± 0.76</td>
<td>0.41hb ± 0.008</td>
<td>0.42hb ± 0.002</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + n-butanol fraction (200)</td>
<td>526.67 ± 4.94</td>
<td>361.21 ± 3.97</td>
<td>523.94 ± 3.71</td>
<td>558.63 ± 4.95</td>
<td>49.71 ± 1.31</td>
<td>6.75 ± 1.09</td>
<td>2.72 ± 0.22</td>
<td>3.14 ± 0.05</td>
<td>1.25 ± 0.03</td>
</tr>
<tr>
<td>CCl⁴ (2ml) + n-butanol fraction (400)</td>
<td>498.67 ± 3.98</td>
<td>335.21 ± 2.86</td>
<td>487.94 ± 4.29</td>
<td>512.63 ± 4.77</td>
<td>54.71 ± 1.27</td>
<td>6.88 ± 1.52</td>
<td>2.99 ± 0.15</td>
<td>2.95 ± 0.009</td>
<td>1.61 ± 0.004</td>
</tr>
<tr>
<td>Silymarin (100)</td>
<td>72.4hb ± 1.17</td>
<td>50.3hb ± 2.91</td>
<td>341.17hb ± 1.22</td>
<td>383.17hb ± 1.13</td>
<td>79.91hb ± 1.02</td>
<td>8.11hb ± 1.02</td>
<td>4.01hb ± 0.17</td>
<td>0.49hb ± 0.011</td>
<td>0.43hb ± 0.005</td>
</tr>
</tbody>
</table>

Values are mean ± S.E.M.; n = 6; *P<0.05, **P<0.01, ***P<0.001, CCl₄ Vs control; bP<0.05, bbP<0.01, bbbP<0.001, extract treated groups Vs CCl₄
CONCLUSION

The present study provides data for fixing up the Pharmacopoeial standards. Gossypin a bioflavonoid compound was isolated for the first time from the flowers of *T. populnea* which can be taken as a chemical marker for deciding the quality of the flowers of *T. populnea*. The hepatoprotective activity of *T. populnea* extracts and the isolated compound proved the therapeutic efficacy which supports the traditional use of the plant. Toxicological study proved that the isolated compound was non toxic. Scientific validation of the flowers of *T. populnea* was established for its traditional claim as folklore medicine though further clinical research is required before declaring this isolated compound as a drug for hepatitis.

REFERENCES


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Table 4 — The effect of isolated compound on the biochemical parameters in serum of CCl4 intoxicated rats

<table>
<thead>
<tr>
<th>Treatment (mg/kg)</th>
<th>ASAT U/l</th>
<th>ALAT U/l</th>
<th>ALP U/l</th>
<th>LDH U/l</th>
<th>TC mg/dl</th>
<th>Total Protein g/l</th>
<th>Albumin g/l</th>
<th>Total Bilirubin mg/dl</th>
<th>Direct Bilirubin mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>70.1 ± 0.82</td>
<td>57.7 ± 0.97</td>
<td>331.94 ± 2.16</td>
<td>372.47 ± 2.54</td>
<td>77.68 ± 0.71</td>
<td>8.04 ± 0.19</td>
<td>4.71 ± 0.16</td>
<td>0.49 ± 0.005</td>
<td>0.396 ± 0.002</td>
</tr>
<tr>
<td>CCl4 (2ml)</td>
<td>523.14aaa ± 3.14</td>
<td>411.28aaa ± 2.72</td>
<td>519.24aaa ± 1.96</td>
<td>627.56aaa ± 3.78</td>
<td>44.14aaa ± 1.11</td>
<td>5.94aaa ± 0.91</td>
<td>2.11aaa ± 0.71</td>
<td>3.52aaa ± 0.06</td>
<td>1.82aaa ± 0.08</td>
</tr>
<tr>
<td>CCl4 (2ml) + Isolated compound (100)</td>
<td>97.11bb ± 1.37</td>
<td>85.3bb ± 1.49</td>
<td>401.08bb ± 3.45</td>
<td>432.13bb ± 2.12</td>
<td>86.16bb ± 1.53</td>
<td>6.97bb ± 1.14</td>
<td>3.51bb ± 0.92</td>
<td>0.82bb ± 0.007</td>
<td>0.79bb ± 0.003</td>
</tr>
<tr>
<td>CCl4 (2ml) + Isolated compound (200)</td>
<td>74.9bbb ± 1.23</td>
<td>62.6bbb ± 1.11</td>
<td>371.14bbb ± 3.03</td>
<td>392.37bbb ± 2.04</td>
<td>82.27bbb ± 1.12</td>
<td>7.31bbb ± 1.02</td>
<td>3.96bbb ± 0.71</td>
<td>0.42bbb ± 0.004</td>
<td>0.34bbb ± 0.002</td>
</tr>
<tr>
<td>Silymarin (100)</td>
<td>71.7 bbb ± 1.13</td>
<td>60.2 bbb ± 1.03</td>
<td>351.26 bbb ± 1.75</td>
<td>382.55 bbb ± 2.26</td>
<td>79.42 bbb ± 1.43</td>
<td>7.71 bbb ± 0.11</td>
<td>4.64 bbb ± 0.17</td>
<td>0.51 bbb ± 0.09</td>
<td>0.42 bbb ± 0.003</td>
</tr>
</tbody>
</table>

Values are mean ± S.E.M.; n = 6; *P<0.05, **P<0.01, ***P<0.001, CCl4 Vs control; *P<0.05, **P<0.01, ***P<0.001, extract treated groups Vs CCl4.

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Fig. 2. (a) Histopathology of normal rat liver; (b) Histopathological changes in CCl4 intoxicated rats where the arrow indicates necrosis and inflammation; (c) Histopathological changes in liver treated with isolated compound (200 mg/kg).
The Ameliorative Effect of *Rubus Fruticosus* Fruits on Pyloric Ligation Induced Ulcer in Wistar Albino Rats

J. C. Hanish Singh, B.Pharm, M.Pharm, PhD, J. Anbu Jeba Sunilson, B.Pharm, M.Pharm, PhD, and Hisyam Bin Muhammed, B.Sc

**ABSTRACT**

**Introduction:** The etiology of peptic ulcer is unknown in most of the cases, yet it is generally accepted that it results from an imbalance between aggressive factors and the maintenance of mucosal integrity through the endogenous defense mechanism. The two most common types of peptic ulcers are called “gastric ulcers” and “duodenal ulcers”. In traditional medicine, several plants and herbs have been used to treat gastrointestinal disorders, including gastric ulcers.

**Objective:** We evaluated the therapeutic effects of *Rubus fruticosus* as an anti-ulcer drug, in pyloric ligation ulcer induced model and estimated the ulcer index, volume of gastric secretion and acidity of gastric juice using standard drug omeprazole in Wistar albino rats.

**Methods:** The animals were randomly divided into 5 groups, consisting of 6 rats of either sex. The animals were treated with drug for ten days. On the tenth day the animals were fasted for 36 hours and surgery (pyloric ligation) was carried out. After 4 hours, the animals were sacrificed; stomachs excised and ulcer index, gastric juice volume, total acidity, free acidity and pH were determined.

**Results:** The results indicated that there were a significant reduction in ulcer index, gastric juice volume and that the level of pH was maintained.

**Conclusion:** The study revealed the antiulcer property of *Rubus fruticosus* and that it may be a potential therapeutic agent for the treatment of peptic ulcer.

**Keywords:** *Rubus fruticosus*, pyloric ligation induced ulcer, rats

**INTRODUCTION**

Gastric and duodenal ulcers usually cannot be differentiated based on history alone, although some findings may be suggestive. Epigastric pain is the most common symptom of both gastric and duodenal ulcers. It is characterized by a gnawing or burning sensation and occurs after meals classically, shortly after meals with gastric ulcer and 2-3 hours afterward with duodenal ulcer. In uncomplicated peptic ulcer disease (PUD), the clinical findings are few and nonspecific. “Alarm features” that warrant prompt gastroenterology referral includes bleeding, anemia, early satiety, unexplained weight loss, progressive dysphagia or odynophagia, recurrent vomiting, and family history of gastrointestinal (GI) cancer. Patients with perforated PUD usually present with a sudden onset of severe, sharp abdominal pain. Herbal drugs have been a precious source of novel molecules and considered as an alternative source in search for new drugs. A wide range of plants used in conventional medicine are recognized to possess gastro-protective and antiulcer properties that may, after possible chemical manipulation, provide new and improved antiulcer drugs.1,2

*Rubus* species were a food and medicinal source documented in the writings of the ancient Greeks, Romans, and Asian medicinal traditions.3 Fruit extracts of *Rubus* have been used as colorants and tested as anticarcinogenic, antiviral, antiallergenic and cosmetic moisturizing compounds. *Rubus fruticosus* (Rosaceae) is also known as Karwara, Akara, Ach, and Baganrra in Northern areas of Pakistan.4 Just as diverse Rubus species were found throughout the world, diverse uses for *Rubus* appear in many of the traditions of ancient medicine. *Rubus* plants have played a small but consistent role in the pharmacology of herbal medicines.

The parts of *R. fruticosus* including fruit, leaves, root and steam may provide us with massive benefits. In this investigation, the experiment was designed to evaluate the gastroprotective and antiulcer effects of *R. fruticosus* fruits extract.

**MATERIALS & METHODS**

**Plant material and extraction**

The fruits of *R. fruticosus* were collected from a nearby commercial vendor, and authenticated by Assoc. Prof. Dr. J. Anbu Jeba Sunilson. The freshly collected plant materials were washed thoroughly in tap water and dried under shade. A weighed quantity of dried fruits was powdered and extracted using an aqueous methanolic solution. The extract was further concentrated and the obtained residue was used for the in vivo studies.
was crushed partially using a mixer to produce a coarse powder, mixed with 95% ethanol to get a homogenous suspension and kept for maceration with absolute ethanol for seven days. After seven days the R. fruticosus extract was filtered and evaporated to dryness using rotary vacuum evaporator and refrigerated in air tight container.

Animals

Female Wistar albino rats (180–220 g) were used. The animals were fed with standard pellet diet with free access to drinking water and kept in standard conditions of 12 h dark/12 h light. All the experimental protocol was approved by the institutional animal ethical committee of KPJ Healthcare University College, Nilai and the experimental procedures were strictly adhered to the ethical committee. Fasting was applied prior to all assays as standard drugs and extract were administered orally (by gavage) with distilled water as the vehicle.

Experimental Design

Grouping & Induction of Ulcer by pyloric Ligation

The animals were divided in five groups of each six. Group 1 (control): Treated with distilled water, Group 2: (Negative Control) -Pyloric ligation ulcer induced and treated with distilled water, Group 3: (Standard drug OMZ) -Pyloric ligation ulcer induced and treated with 200mg/kg of R. fruticosus, Group 5: Pyloric ligation ulcer induced and treated with 400mg/kg of R. fruticosus. The animals were fasted for 36 hours and provided with water ad libitum. During this time they are housed singly in cages with raised bottoms of wide wire mesh in order to avoid cannibalism and coprophagy. Under ketamine and xylazine (80 mg/kg and 10 mg/kg respectively) anesthesia a midline abdominal incision was made. The pylorus is ligated, care being taken to avoid the blood supply to the pylorus.5 The stomach was carefully replaced and the abdominal wall was closed by interrupted sutures.

Biochemical Parameters

Ulcer Index

After the pyloric ligation, the animals were deprived of both food and water during the postoperative period and were sacrificed 4 hours after the operation. The stomachs were dissected, and the contents were drained into tubes and subjected to biochemical analysis. The stomachs were then cut along the greater curvature, the inner surfaces were examined for ulceration, and the ulcer index was calculated.6

Estimation of Gastric volume, pH, Free and Total Acidity

The gastric juice collected was centrifuged for 5 min at 2000 rpm and the gastric volume of the supernatant was expressed as ml/100g body weight. The mucosal scrapings were taken from the glandular portion of the stomach and were homogenized in distilled water (10 mg/ml) to be used for various biochemical estimations such as total acidity and free acidity. Total acidity and free acidity of the gastric juice was estimated by titration with 0.01 N NaOH using Topfer’s reagent as the indicator.7

RESULTS

Ulcer Index

The negative control animals (Group II) exhibited higher mean levels of ulcer index when compared to the control animals (P < 0.001). In the treatment group, the mean ulcer index was decreased in group V compared with group II, however there was no significant effect of R. fruticosus on low dose, which indicates the higher dose is more effective as ulcer protectant (Table: 1 and Figs. 1-5). Fig. 1, represents the sample of (Group I) control animal, Fig. 2, represents the sample of (Group II) control negative control animal, Figs. 3, 4 and 5 represent the sample from standard (Group III, omeprazole), Group IV (low dose, 200mg/kg) of R. fruticosus extract and Group V (high dose, 400mg/kg) of R. fruticosus extract treated animals respectively.

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Dose(mg/kg)</th>
<th>Ulcer index</th>
<th>% Protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Control</td>
<td>Saline (1 ml)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>II</td>
<td>(-) Control</td>
<td>Saline (1 ml)</td>
<td>7.20±0.25</td>
<td>0</td>
</tr>
<tr>
<td>III</td>
<td>Omeprazole</td>
<td>20</td>
<td>2.20±0.50</td>
<td>86a</td>
</tr>
<tr>
<td>IV</td>
<td>R. fruticosus</td>
<td>200</td>
<td>3.50±0.50a</td>
<td>74a</td>
</tr>
<tr>
<td>V</td>
<td>R. fruticosus</td>
<td>400</td>
<td>2.50±0.60b</td>
<td>82b</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM (n=6). Symbol represents the statistical significance done by ANOVA, followed by Tukey’s multiple comparison tests.

a P≤0.001, indicates comparison of group II with group I and group III with group II
b P<0.01, indicates comparison with group V with group II
**Gastric volume, pH, Free and Total Acidity**

Treatment with *R. fruticosus* reduced the gastric volume, pH, free and total acidity. The negative control animals (Group II) showed an increased activity on gastric volume, pH, free and total acidity (*P* < 0.001) when compared to the control animals. In the treatment group VI, there was no significant change in the pH of the gastric juice but in the group V, the animals treated with high dose exhibited significant (*P* < 0.001) reduction when compared to group II. In case of the other parameters excluding pH, all the treatment groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Dose (mg/kg)</th>
<th>pH of gastric juice</th>
<th>Volume of gastric juice (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Control</td>
<td>Saline (1 ml)</td>
<td>2.40±0.20</td>
<td>7.20±0.20</td>
</tr>
<tr>
<td>II</td>
<td>(-) Control</td>
<td>Saline (1 ml)</td>
<td>2.03±0.18&lt;sup&gt;a&lt;/sup&gt;</td>
<td>9.72±0.32&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>III</td>
<td>omeprazole</td>
<td>20</td>
<td>4.70±0.15&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.20±0.18&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>IV</td>
<td><em>R. fruticosus</em></td>
<td>200</td>
<td>3.40±0.20</td>
<td>4.60±0.12&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>V</td>
<td><em>R. fruticosus</em></td>
<td>400</td>
<td>4.20±0.18&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.90±0.15&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Table 2 — Effect of ethanolic extract of *R. fruticosus* in pH of the gastric juice and volume of gastric juice**

**Table 3 — Effect of ethanolic extract of *R. fruticosus* in free and total acidity of gastric juice**

Values are expressed as mean ± SEM (n=6). Symbol represents the statistical significance done by ANOVA, followed by Tukey’s multiple comparison tests.

<sup>a</sup> *P*<0.001, indicates comparison of group II with group I as well as group III and V with group II

<sup>b</sup> *P*<0.01, indicates comparison with group IV and V with group II

**Figs. 1-5. Samples from the different experimental groups.**
showed a dose dependent reduction with \( P < 0.01 \) in low dose and \( P < 0.001 \) in high dose respectively. All the results were tabulated in Tables 2 and 3.

DISCUSSION

Peptic ulceration, considered to be one of the modern age epidemics, has been affecting approximately 10% of world population. The etiology of peptic ulcer is unknown in most of the cases, yet it is generally accepted that it results from an imbalance between aggressive factors and the maintenance of mucosal integrity through the endogenous defense mechanism. Pylorus ligation induced ulcer was used to evaluate the effect of \( R. fruticosus \) on gastric acid secretion and mucus secretion. The ligation of the pyloric end of the stomach causes accumulation of gastric acid in the stomach. Alteration in gastric secretion\(^8,9\) and mucus secretion. The ligation of the pyloric end of the stomach may lead to ulceration of the rat gastric mucosa.\(^1\) It is due to the inhibition of gastric acid production through proton pump inhibition and also antioxidant effect. However further studies are needed to confirm the mechanism of the inhibition of gastric acid formation and reduction in acidity.

REFERENCES

Communication Needs of the Non Arab Non English (NANE) Speaking Older Adults Requiring Healthcare

Thuraya Abduljalil Alabsi, PhD Ed., Rasidah Mohamed, SRN, PhD, and Muhammad Taha, MBBS

ABSTRACT

The optimal goal of communication in healthcare is to obtain correct information for accurate diagnosis in the delivery of treatments, medications, health education and other healthcare management. Effective communication between healthcare personnel and patients forms a crucial element to meet patient’s healthcare and safety needs. During the pilgrimage seasons influx of NANE speaking patients’ into the Saudi healthcare facilities swelled specifically in the holy cities of Madinah and Mecca and the local healthcare personnel commonly face difficulties in communicating with these patients.

This research focuses on bridging the communication needs between NANE older adults’ patients and healthcare givers in the city of Madinah, through the use of a health communication booklet containing illustrative drawings to aid in pin pointing patients problems and their required care. This research employed a cross sectional descriptive method. Data were collected through two sets of questionnaires, directed to doctors, nurses and patients.

The results of the first set of questionnaire were used to design the illustrative booklet. The results of the second questionnaire evaluate the usefulness of the booklet in facilitating communication between NANE older adults’ patients and health professionals to improve healthcare needs of pilgrims in Madinah, Mecca and eventually in Saudi Arabia. KPJ Medical Journal 2016; 6:22–27

Keywords: Communication needs, non Arab non English speaking, booklet.

INTRODUCTION

In healthcare settings context, good communication is crucial between patients and staffs. Among the main objectives of communication were to obtain and convey information such as medical complains, medication orders, treatment regimes, health education and others. Communication forms a crucial tool in the two way interaction for interchange of thoughts and information from staff to patients and vice versa. Health organizations are responsible to take action to address and meet patients’ rights and needs for effective communication. As such, communication forms a critical element not only in patient safety but also in meeting quality care.

Problem Statement

Healthcare organizations in the Saudi Arabian Kingdom encounter large number of non Arab and non English (NANE) speaking patients. For the Saudi healthcare system, the problem becomes intensified during the pilgrimage seasons, when the kingdom plays host to an influx of NANE speaking pilgrims from all over the world. Unclear communication can cause the whole healthcare encounter to fall apart and language barriers further increase its complexity.

At the very least NANE patients should be able to “communicate” their complaints to the healthcare professionals for responses. Inappropriately addressed, it can increase the risk of inefficient utilization of healthcare resources causing errors in healthcare management. For patients’ safety effective communication must be addressed. To effectively assess, diagnose, and treat NANE patients, appropriate communication tools overcoming the barriers of the spoken words need to be developed and empirically examined. This forms the focus of this study.

General Objective

The general aim of the research was to develop a diagrammatic communication booklet to meet health needs of the older adults NANE speaking patients.

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Specific objectives

The specific objectives were to determine the communication needs of the older adults NANE speaking patients requiring healthcare, develop communication material in the form of booklet of illustrative drawings to address the communication needs of the NANE speaking patients requiring healthcare and evaluate the effectiveness of the communication tool in reaching the targeted group.

The Significance of the Research

This study has the breakthrough potential of improving NANE patients' healthcare needs especially during the pilgrimage seasons in the Madinah and Mecca regions and eventually in the Kingdom of Saudi Arabia.

Literature Review

Madinah, the Holy City

Madinah, being the second holy city of the Islamic world, is visited by pilgrims from all over the world as it has sanctity in the hearts of Muslims. It was the location of Dar al-Hijra, the place of revelation and the resting place of the Messenger of Allah [Peace be Upon Him] and the holy mosque. It also housed the first Islamic society and emerged as the first capital of Islam. The multiple virtues of Madinah include the many “hadiths” or sayings of the Prophet.5

Local Health Situation

Like any other growing cities in the world, the population of Madinah comprises of mixed nationalities and age groups. More than 29.4% of the populations are non-Saudis, reflecting the impact of external migration in the growth of Madinah’s population.6

A large number of healthcare staff in Saudi Arabia are non-Arabic speaking but were able to converse in English while most local patients speak Arabic. However, during the hajj or umrah seasons some pilgrims converging from all corners of the world may not be able to speak neither Arabic nor English. During the pilgrims’ stay, some do become ill, especially the older adults thus requiring hospitalization. As a result during these seasons, there are diverse populations of NANE speaking patients and non-Arab speaking staff within the healthcare facilities. With such a population mix of patients and staff, communication barriers may cause significant problems. Miscommunication may increase risk of medical errors with fatality being the worst case scenario.7 The imperative requirement is for the development of a universally acceptable communication method to ease multi language patients and staff understanding.

Communication and What It Entails

Communication a complex process stated to go beyond the interchange of thoughts and information, as it involves speaking and listening, watching nonverbal cues to what is being communicated and interpreted within the culture of each party.8 The outcome may either be understanding and acceptance or non-understanding and rejection of the ideas being communicated. Given the varied cultures, the ageing population commonly requiring treatment and differences in languages of both patients and healthcare personnel, the communication problems in the Saudi healthcare settings can be very challenging.

Common Sensory Changes in the Older Adults

The complexity of the communication process can be further complicated by ageing. The normal aging process commonly involves sensory loss, decline in memory and slower processing of information.8,9,10 Elderly patients without cognitive deficits, decline in vision, hearing, and the mobility of hundreds of multi lingual pilgrims, results in the inability to distinguish high-pitched sounds. This is often coupled with decline in eyesight. By 40 years of age, vision begins to decline and by 70, poor vision would be common.

Addressing Language Barriers in Hospitals

Addressing the language barrier could be a means of improving quality and safe patient care. A study shows that communication barriers result in misuse of services.11 In other cases, the lack of effective communication results in inappropriate use of prescribed medications or the patient’s inability to comply with follow-up instructions.12 Language and communication barriers have caused unnecessary intubations in trauma patients13 with a higher risk for serious medical events.14,15,16 The American Health Lawyers Association states that, “Without a comprehensive strategy for assisting individuals with language inadequacy, the risks of missed diagnoses, delay of care, and concomitant malpractice exposure increase for hospitals and healthcare providers.”17

Nonverbal communication is alternative to communication with the NANE speaking elderly adults. However, on its own, it has its drawbacks as some pertinent questions regarding patients’ needs and requirement cannot be addressed.11 Hospitals have reported use of language translators to overcome communication problems but given the short term stay and the mobility of hundreds of multi lingual pilgrims, the number and type of translators required is huge.

Using Pictures in Health Communication

Nineteen studies with experimental-control group designs and random assignment to groups investigating the effects of adding pictures to written or spoken texts
were identified.\textsuperscript{18} The overall results showed that pictures can provide significant benefits as it markedly increased attention to and recall of health education information. Other published articles on improving communication concluded pictures tend to assist in patient comprehension and communication, which directly impacts service delivery and quality of care.\textsuperscript{19,20,21} 

Peer reviewed researches assessed the effects of pictures on health communication. One study involved usage of osteoarthritis educational booklets.\textsuperscript{22} The main findings revealed that pictures in booklets enhanced overall communication and played an important role in improving patients’ comprehension to benefit all specifically those with low literacy level. Moll’s recommendations for practice include: using the simplest drawing or pictures possible; minimizing distracting details in pictures; including people from the intended audience to design the pictures; having health professionals plan the pictures, not artists and last but not least; evaluating the effects of pictures to include systematic evaluation of their effects in clinical settings.

Applying the plausible recommendations of the above review, this study intended to investigate the effects of using pictures as a facilitating tool, to improve communication between patients and healthcare staff from different linguistic and cultural backgrounds.

METHODS

A cross sectional descriptive research method was employed. The study was conducted in two phases. In phase one, the communication needs of the NANE speaking older adults’ patients requiring healthcare was determined. Doctors and nurses in the Madinah region were interviewed using a Likert scale questionnaire proposing relevant areas of healthcare components to be represented as communication drawings in booklet form. The drawings consisted of topics as in Table 1.

Phase two followed the booklet production. Another set of questionnaires were used to obtain healthcare professionals’ and patients/targeted population evaluation of the communication material.

Developing the communication material

Following the determination of the communication need, suitable pictures from various sources matching the needs were developed. An artist was recruited in order to convert the pictures into similar images. Modifications, additions, and deletions were made for enhancement. Finally, the drawings were scanned and indexed into the identified groups. A specific appendix on photos of various medications was developed as suggested by the medical fraternities. This was classified according to diseases.

Sampling Population

Universal sampling method was made to include all medical doctors and the nursing staff in Uhud, Madinah Maternity and Children, King Fahd, Al Ansar Hospitals, NANE speaking older adult patients and foreign students from a local University in Madinah.

Data Collection

In phase one, a hundred and fifty seven (157) nurses and doctors in three hospitals namely Uhud, Madinah Maternity and Children, King Fahd Hospitals were sampled.

Phase two entailed obtaining feedback on the effectiveness of the communication booklet from 76 doctors, nurses and patients. To ensure a high return rate, an interview data collection method was used in both phases. As pilgrims seldom required the services of the Maternity and Children Hospital, data were not collected from this hospital during the second phase.

Ethical approval

Ethical approval was obtained from Taibah University, University Islam Madinah and the Medical directors of the hospitals involved.

Statistical Analysis

Using the SPSS, statistical analysis was carried out using scoring and descriptive frequencies.

Analysis

Descriptive analysis on phase one indicates the $n$ to be one hundred and fifty seven samples comprising of 43 doctors and 114 nurses. Most of the doctors (81, 55.8%) were consultants and (19, 44.1%) were specialists. Most of the nurses 46 (40.7%) were diploma holders, 38 (33.6%) were graduate nurses and 16 (6%) were certificate holders. The majority of the nurses (79%) were foreigners and the remaining were Saudis.

The questionnaire requested respondents to express their level of agreement or disagreement on a list of items (e.g. symptoms and procedures) proposed for inclusion in the planned communication tool and to suggest for other items if necessary.

<table>
<thead>
<tr>
<th>Doctor’s Health Complaints</th>
<th>Past Medical History</th>
<th>Drugs patients on</th>
<th>Past Surgical History</th>
<th>Animal/bird rising occupation</th>
<th>Allergies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors</td>
<td>Activities of Daily living</td>
<td>Personal hygiene</td>
<td>Medication</td>
<td>Mobility</td>
<td>Oxygenation</td>
</tr>
<tr>
<td>Nurses</td>
<td>Elimination</td>
<td>Wound care</td>
<td>Vital signs</td>
<td>Specimen Taking and Investigations</td>
<td></td>
</tr>
</tbody>
</table>
The outcomes of the first phase were used to further enhance the communication material. Most respondents (95%) showed agreement on the list of communicative needs as 'very important' and 'important'. Some doctors and nurses also suggested additional communication needs as presented in Table 2.

During phase two of the data collection, most of the elderly hospitalized patients were either ill or were not able to converse in Arabic or English. With such a situation, foreign students from a local University in Madinah were taken as substitute. The samples comprised of 70 doctors and nurses and 45 foreign students acting as patients representative.

The findings revealed that 24.2% and 37.8% of participating medical and nursing staff respectively had less than 10 years of experience while the remainder of the samples (38%) had more than 10 years of experience. Most of the doctors were consultants and specialists (76%), while nearly a quarter (24.4%) were residents. Most nurses (49%) were graduate holders while 42% were diploma and only 9% were certificate holders. More than half of the patients representative respondents (86.7%) were male, aged between 18–30 years old. Students’ participations from the male only Islamic University explained the high male respondent numbers.

RESULTS

This part of the report focuses on examples high and low mean score of particular items. The results in phase one, showed high means (3 - 4.69 out of 5), for all communication needs indicating respondents agreement in perceiving these items as important in Table 3. Examples of lowest and highest means were tabulated in Table 4.

The lowest mean were for hoarseness of voice (2.95) and pain sites (3.26) items. For hoarseness of voice, only 23 (20%) respondents saw it as ‘very important’ and 26 (22.6%) saw it as ‘important’. While 27 (23.5%) of the respondents saw it as ‘Not important at all’ and 21 (18.3%) saw it as ‘Not very important’.

For Pain-Sites three quarters of the sample saw the current drawing as important. A total of 24 (21%) respondents saw it as ‘very important’ and 31(27.6%) saw it as ‘important’, 18 (15.7%) saw it as ‘Not important at all’ and 13 (11.3%) saw it as ‘Not very important’.

Some items, such as. x-ray (4.68) and finger pricks (4.61) had high means. These reflect strong positive feelings towards the relevance of the drawing to the respondents’ communication needs. (Fig. 1)

Overall the results to the questionnaire indicated that all respondents had positive attitudes towards the communication drawings.

DISCUSSION

The aim of conducting the study was to determine the communication needs of the NANE older adult speaking patients requiring healthcare. The result indicated that 95% of the participants were in agreement with the provided list of communication needs. Some doctors added further communication needs, of abdominal pain, bloody cough, back pain, chest pain, and loss of consciousness. Nurses added more communication needs to include shaving hair, cutting nails, washing face, washing hands, and insertion of suppositories.

The majority of the results showed high mean scores for the communication needs indicating their significance. When some drawings were considered not to depict the meaning, modifications were suggested. For example, for “hoarseness of voice” the suggestion was to add in a mute symbol to the drawing to make it clearer, Fig. 2.

For pictures depicting pain, the nurses indicated using the Wong & Baker Pain Scale for pain assessment and suggested substituting it for the current drawing. Based on this idea, a pain intensity scale was drawn and added, Fig. 3.

Results obtained from the analysis were used for final enhancement of the communication drawings booklet.

Respondents comment on the drawings

The respondents expressed positive responses as the cartoon drawing were stated to be enjoyable and when seen as a useful way to help patients enhance their comprehension and communication. The only criticism was on the ‘uncovered’ female characters in the drawings to be changed to those with head scarf, in accordance with the Islamic culture.

Publication and distribution of booklet

The first priority for the booklet distribution was in Madinah and Mecca as these cities receive the huge influx of pilgrims. Consideration was also made to the communication needs in the Kingdom particularly in

<table>
<thead>
<tr>
<th>Table 2 — Additional Communication Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Doctors</strong></td>
</tr>
<tr>
<td>Back pain</td>
</tr>
<tr>
<td><strong>Nurses</strong></td>
</tr>
<tr>
<td>Washing hands</td>
</tr>
</tbody>
</table>
Table 3 — Sample responses toward hoarseness of voice and pain sites

<table>
<thead>
<tr>
<th>Hoarseness of voice</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Pain-Sites</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not important at all</td>
<td>27</td>
<td>23.5</td>
<td>18</td>
<td>15.7</td>
<td></td>
</tr>
<tr>
<td>Not very important</td>
<td>22</td>
<td>19.1</td>
<td>13</td>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>Partially important</td>
<td>17</td>
<td>14.8</td>
<td>29</td>
<td>25.2</td>
<td></td>
</tr>
<tr>
<td>Important</td>
<td>26</td>
<td>22.6</td>
<td>31</td>
<td>27.0</td>
<td></td>
</tr>
<tr>
<td>Very important</td>
<td>23</td>
<td>20.0</td>
<td>24</td>
<td>20.9</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>115</td>
<td>100.0</td>
<td>115</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 4 — Items with the lowest and highest mean scores

<table>
<thead>
<tr>
<th>Items with lowest scores</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hoarseness of voice</td>
<td>0*</td>
<td>5</td>
<td>2.95</td>
<td>1.49762</td>
</tr>
<tr>
<td>Pain-Sites</td>
<td>1</td>
<td>5</td>
<td>3.26</td>
<td>1.33828</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items with highest scores</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-ray</td>
<td>0</td>
<td>5</td>
<td>4.68</td>
<td>1.08</td>
</tr>
<tr>
<td>Finger prick</td>
<td>0</td>
<td>5</td>
<td>4.61</td>
<td>1.08</td>
</tr>
</tbody>
</table>

*0 missing answer

Fig. 1. Communicating finger prick and X-ray

Fig. 2. Communicating hoarseness of voice

Fig. 3. Pain intensity scale
view of the large numbers of non-Arabic speaking healthcare professionals. An initial print of 10,000 copies of booklets for distribution to hospitals in the Madinah region and around the Kingdom was made.

Limitations

Inputs from the foreign students in the Islamic university were used as a substitute due to the difficulties of interviewing the ill older adult patients. Their opinion and views may not exactly represent that of the actual NANE patients.

It was a challenge in getting doctors and nurses to evaluate the final drawings and to fill the questionnaire as they were extremely busy during the data collection period. However, most of them liked the aim of the research and confirmed the need for the booklet.

Recommendations for Further Study

Building on the foundation of the current research, two main areas of further study were suggested. A follow up study on the effectiveness of the booklet in clinical settings was proposed to survey staff and patients opinion on the usefulness of the booklet as well to identify additional communication needs. Future research could build on the work of this study with the aim of producing segment-specific addition by investigating the communication needs of other groups, such as in maternity, obstetric and child health.

REFERENCES

Needle Stick Injury: Towards Better Compliance

Parameswary V, SRN,1 Nor Afizah MS, SRN, Sumaria AM, SRN, and Nor’aini S, SRN1

ABSTRACT
The objective of this study is to determine prevalences and factors associated with needle stick injuries and to identify the counter measure towards better compliance towards prevention of needle stick injury.

Method: A total of 100 staff nurses participated in this survey using a standard questionnaire and a checklist to get data on contributing factors on needle stick injuries incidence. The questionnaire was anonymous and divided to 5 parts: 1. Knowledge, 2. Compliance, 3. Adequate sharp bin, 4. Adequate training and 5. Main causes why nurses unable to comply.

Result: Part 1, Part 2, and Part 4 (100%) compliances. Part 3, (13%) limited sharp bin placed. Part 5, two different answers, 75% shortage of staffs and 25% staff attitude. Surveyed, 78% non compliance on proper disposal.

Counter measure: There were 5 counter measures implemented in the process involving all State Registered Nurse:
1. Implemented safety lock device.
2. Sharp disposal poster displayed in each unit.
3. Booklet on Do’s & Don'ts when handling sharps introduced to each unit.
4. Sharp bins were allocated in strategic location.
5. Policy and procedure on handling sharps were enforced to all staffs during monthly awareness.

Conclusion: There were many contributing factors leading to needle stick injuries.
1. The main causes for needle stick injuries were tiredness (30%), heavy workload (25%), attitude (20%) and inattention or haste (25%).
2. Limited sharp bin was not really a contributing factor to needle stick injuries.
3. Hence, the management need to focus on overcoming the issues above.

Keywords: Needle stick injury, nurses

INTRODUCTION

Needlestick injury is a common occupational hazard among healthcare workers and can result in the spread of bloodborne diseases such as Hepatitis and HIV. In Malaysia, whilst work place accidents and injuries may have reduced overall, for the period 2000 to 2006, the number of needlestick injuries reported by healthcare workers increased by 50% from 498 to 746.1 A European Parliament report in 2010 described needle stick injuries as one of the most serious health and safety threats in workplace as well as a high cost burden that also caused severe distress.2 The Ministry of Health of Malaysia defines needle stick injuries as injuries caused by suture or hollow-bore needles. The number of needle stick injuries among nurses in KPJ Selangor Specialist in year 2011 was three cases, 2012 was four cases and 2013 is one case.

Figs 1 and 2 showing relationship between needle stick incidence and medical expenses for needle stick injury.

Fig. 1. Incidence of needle stick injuries from year 2011 to 2013

Fig. 2. Medical expenses incurred to treat post needle stick injuries from 2011 to 2013

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Correspondence: Parameswary V, SRN
KPJ Selangor Specialist Hospital
KPJ Selangor Specialist Hospital is a Malaysian Standards for Quality (MSQH) accredited hospital that imparts service according to KPJ Policies and Procedures (P&P), Hospital Standard Operation Procedures (SOP) and Guidelines given by the Ministry of Health (MOH) as well as MSQH standards. All healthcare workers are made aware of these during staff orientation to the individual services. The introduction of these workplace policies, training and support, as well as the necessary equipment, contribute to a less hazardous and less stressful working environment.

OBJECTIVE

A study was done in 2013 on needle stick injuries in the hospital. The objective of this study was to determine the prevalence and factors associated with needle stick injuries and to reduce the incidence of needle stick injuries in KPJ Selangor Specialist Hospital.

METHODOLOGY

A total of 100 staff nurses participated in this survey. A questionnaire was developed and given to all the participants to be answered. The questionnaire consists of 15 questions divided to five parts:

1. Awareness of hospital guidelines, standard of practice (SOP) and policy and procedure (P&P) displayed.
2. Compliance to the hospital guidelines, SOP and P&P at all time.
3. Adequacy of sharp bins provided.
4. Adequate training and information provided regarding handling of sharps.
5. The reason why nurses are unable to comply with the guidelines, SOP and P&P at all times.

RESULT

Fig. 5 shows that there was 22% staff compliance on throwing the needle straight into the sharps bin. The other 78% staff use a tray to transit the used needle when the staff did not bring the IV procedure trolley that has the sharps bin attached to the trolley.

Analysis of the results showed tiredness, heavy workload, and inattention or haste are all related to shortage of manpower. According to Mohamad & Ismail (2003), critical staffing shortaged and the pressures of work will encourage staff to take procedural shortcuts, abandon more time-consuming safe practices and escalate the risk of injury. Nurses’ attitude and experience also contributes to incidence of needle stick injuries. In many healthcare organization, majority of the nursing workforce are junior nurses with less than 5 years experience.

Fig. 6 shows staffing status from 2011 to 2013 where majority of the staff are junior staff with 0-5 years experience with average of 66% and only 34% of staff are senior staff. High turnover of staff also give an impact to staff competency on handling sharp where new staff need to be trained and briefed on the hospital policy and procedure on management of sharp (Table 1).

COUNTER MEASURES

As a means to reinforce the use of safety devices, KPJ Selangor has converted 90% of normal devices to safety device. Additional sharp bin are allocated at all strategic locations. Continuing Nursing Education (CNE) on handling and disposal of sharps is an ongoing program throughout the year. For all SRNs it is compulsory to attend the 3 monthly competency exams that will test their knowledge on safe handling of sharps. A one day refresher program by the Infection Control Service is conducted for all SRNs once a year and attendance is compulsory. Guidelines on disposal of sharps in the form of posters are displayed at all services that deal with handling of sharps. The Infection Controls Service has come up with a DO’s & DON’Ts booklet called “Guide on Handling Sharps” that are distributed to all clinical service areas. Enforcement by the Unit Manager/ Nurse Instructor and the Infection Control Service on the usage of injection trolley / blood taking procedure trolley is done during their hospital rounds and checking. There is also ad-hoc checking on staff compliance and knowledge by the Infection Control personal and Nurse Instructor periodically.
Legend:
Part 1 - 100% answered that they have knowledge of guidelines, SOP and P&P hospital.
Part 2 - 100% answered they were unable to comply with the guidelines, SOP and P&P hospital at all times.
Part 3 - 87% answered having adequate sharps bins available.
Part 4 - 100% answered that they have enough training and information regarding handling of sharps.
Part 5 - 90% answered there was shortage of staffs and 30% answered as staff attitude.

Table 1 — Staffing statistic, resignation and recruitment rate from 2011 to 2013

<table>
<thead>
<tr>
<th></th>
<th>2011 (Total bed – 170)</th>
<th>2012 (Total bed – 169)</th>
<th>2013 (Total bed – 173)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Staff</td>
<td>189 (64% - BOR)</td>
<td>193 (63% - BOR)</td>
<td>189 (60% - BOR)</td>
</tr>
<tr>
<td>Recruitment</td>
<td>47 (25%)</td>
<td>25 (13%)</td>
<td>38 (20%)</td>
</tr>
<tr>
<td>Resignation</td>
<td>25 (13%)</td>
<td>20 (12%)</td>
<td>42 (22%)</td>
</tr>
</tbody>
</table>
CONCLUSION

Shortage of nursing staff is a global issue. The excessive workload of the nurses not only reduces quality of patient care but also adversely affects nurses by threatening their physical safety, lowering job satisfaction, causing burnout, and increasing turnover rate.

The attitude of nurses also is a major contributor to needle stick injury incidents. The new generation of graduates have been identified as another contributing factor. Their poor attitude toward patients care and decline in compliance to policy and procedure contributes to the increase incidence.

With use of new safety devices, guidelines, continuous reinforcement and supervisions, adequate equipment, well planned educational programs and with good compliance on safe handling of sharps, the incidence of needle stick injuries in KPJ Selangor has reduced among the nurses.

REFERENCES

Exploring Elements and Strategies of Effective Communication Among Nurses in One Private Hospital in the Southern Region of West Malaysia

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ABSTRACT
Communication is the key component in a healthcare environment. Every single decision about patient care is very much related to how effective communication has taken place. A standardized technique called Situation-Background-Assessment-Recomendation or in short “SBAR” was introduced to healthcare providers to overcome problems such as delay in treatment, wrong procedure, patient dissatisfaction, medication errors, misinformation and frustration among peers. Audits findings have shown that the compliance of staff toward SBAR was far below stakeholders’ expectations. Therefore, the aim of the study was to discover elements and strategies needed for effective communication skills among nurses. This qualitative study was based on two focus group discussions. Audiotape and field notes were used to transcribe verbatim. Thematic and content analysis were used to identify the elements and strategies for effective training. Context analysis explored four themes for effective communication skills among nurses. The study identified training as one of the driving factors for effective implementation of change, among nurses in the hospital.

Keywords: Training, element, strategies, effectiveness, communication, nurses

BACKGROUND
Communication is a key element in healthcare and it plays an important role for effective and efficient management of patient outcomes. Every single decision about patient care is very much related to how effective communication has taken place. Communication is the process of acquiring all relevant information, interpreting this information and effectively disseminating to persons who might need it.1 Communication is of vital importance to everyone involved and it has been said to be the lifeblood of an organization.2 Good interpersonal relationship among employees and peers is very important in ensuring effective communication skills. Robbins et al have stated that no group, individual or organization can exist without communication: before communication can take place a purpose, expressed as a message to be conveyed, is needed. It is passed between sender and receiver.3

In the healthcare setting, clinical communication takes place between patients, doctors, nurses and other healthcare professionals. Communication is a crucial process and continues throughout the hospital journey. It is complex and involves difficult conversations.4 All information, confidentiality, treatments and care of patients will be passed, shared and circulated among nurses who are directly involved in the patient’s care. Although, effective communication is central to safe and effective patient care the quantity and quality of training that nurses require to promote effective communication is lacking.5 Healthcare organizations are high-risk domains by virtue of their increasing patient acuity, technical complexity, and fundamental dependence on human beings to execute the care.6 Communication problems are consistently identified as a leading cause of system breakdown in patient care.6,7,8,9 Ineffective communication between healthcare professionals can lead to unwanted hospital incidents, including delay in treatment, wrong procedures, patient dissatisfaction, medication errors, mortality and dissatisfaction among peers. Communication errors in the healthcare setting often have severe consequences. These mistakes are
estimated to lead to 98,000 deaths and cost the industry in excess of $17 billion annually.\(^{10}\)

As of today, there have not been many studies done in Malaysia on standardized communication skills using the SBAR technique. Adaptation to new skills has been found to be not successful in one of the private hospitals in the South East Region of Malaysia. The management realized that the compliance among staff is far below expectations. Many studies have reported that the SBAR communication tool alone will not significantly improve outcomes. An educational intervention that provides information on communication strategies and styles, and collaboration/teamwork strategies will have a positive effect on work environments, resulting in improved communication, teamwork, satisfaction, and patient safety outcomes.\(^{11}\)

SBAR is a communication format, which was initially developed by the military and refined by the aviation industry to reduce the risks associated with the transmission of inaccurate and incomplete information.\(^{12}\) Effective communication is extremely important to patient safety and has been included in the set of National Patient Safety Goals for the last nine years by the Joint Commission Accreditation. The WHO (World Health Organization) Collaborating Centre on Patient Safety solutions, has suggested a “standardized approach to handover communication between staff”, proposing the use of the SBAR technique.\(^{13}\) The second National Patient Safety Goal directly addresses the issue of communication during report by targeting the need to improve the effectiveness of communication among caregivers and allowing them the opportunity to ask and respond to questions during handoffs.\(^{10}\) Various interventions have been developed to improve quality of care during transitions of patient information. The Situation-Background-Assessment-Recommendations (SBAR) technique provides a framework for organizing information in a clear and concise format. SBAR acronym leads the speaker to convey information in a methodical and logical way that the listener can easily follow.\(^{14}\)

The WHO, World Alliance for Patient Safety, Institute for Healthcare Improvement, National Patient Safety Agency, Agency for Healthcare Research and Quality, and Australian Commission for Safety and Quality in Healthcare have identified skilled communication during clinical handoffs as a priority.\(^{15}\) Improving communication between caregivers can prevent negative patient outcomes and strengthen a teamwork approach to care.\(^{14}\) Providing safe patient care is a challenge in today’s healthcare environment.\(^{16}\) Even with the many advances in technology, basic, effective, interpersonal communication remains essential to the provision of safe patient care.\(^{16}\)

Wong et al. conducted an evidence-based literature review to assess effectiveness of improvement intervention in clinical handoff communication for the Australian Commission on Safety and Quality in Healthcare.\(^{17}\) The researchers have indicated that training and education are essential strategies for effective and successful implementation of effective communication among nurses.

Study by Dingley et al. conducted an observational study of 495 communication events on two different acute care units.\(^{18}\) The purpose of the study was to develop, implement, and evaluate a comprehensive strategy, resulting in a toolkit that could serve as a guide for the education and integration of communication and teamwork factors in clinical practice.

Woodhall et al. concluded that most healthcare providers saw room for improvement regarding communication with additional materials such as flyers and pockets notes.\(^{19}\) It takes about one year to evaluate the efficacy of the SBAR technique among nurses. The researchers reported that the nursing staff were routinely using SBAR during shift report, and both novice and experienced nurses were more confident when calling physicians about a critical situation.

**Problem Statement**

The stakeholder realized that new strategies and elements were needed to ensure staff members were able to adapt into new environments. Therefore, there was a necessity to reduce and overcome the gaps in compliance among healthcare providers.

**Research Objective**

The aim of the study was to explore nurses’ insight into elements and strategies for effective communication skills among healthcare providers in the hospital.

**METHODOLOGY**

**Research design**

This is a qualitative approach to obtain individual insight on elements and strategies for effective implementation.

**Study Setting**

One week prior to the focus group discussion (FGD), all participants were notified via telephone. The discussion was scheduled after working hours to prevent unwanted disruption and to keep privacy. A convenient and comfortable place was arranged far from the public areas. An interview guide was used to ensure participants were asked the same questions. Interviews were tape-recorded and the interviewer also made additional notes in a personal diary. The interview lasted for about 30 minutes or ended when the information was saturated. As soon as possible after recording, the interviewer transcribed the interview verbatim.
Sample

A sample of 16 participants volunteered to take part in the study from medical, surgical, pediatric, multidisciplinary and maternity units in a private hospital in the Southern Region of West Malaysia but only 12 participants came for the discussion. Participants were divided equally into two focus groups and discussions were conducted at different times. Participants who volunteered must possess knowledge and experience on selected topics for discussion. A mixture of staff from various patient care settings were taken for different thoughts and ideas.

Data Collection

Data were collected using semi-structured questionnaires. All discussions were recorded using audiotape and field notes taken with the help of nurse instructors. Questionnaires were developed based on previous literature’s findings and the feedback from the hospital’s Patient Safety Committee. All data were clarified to ensure the validity of the verbatim transcription.

Ethical Consideration

Ethical approval was obtained from Research Ethics Committee. Participation was voluntary. Participants were informed that interviews would be tape recorded and data would be treated anonymously, confidentially and stored in accordance with the data protection act. Interview tapes, notes and transcripts were coded to protect interviewee anonymity and codes were restricted to the interviewer. Informed consent was obtained from every participant.

Data Analysis

The audio tape recordings from the two focus groups were transcribed verbatim. Thematic analysis of the transcripts were facilitated by using Atlas.ti.

RESULT

Demographic data

There were 12 participants aged between 23 to 39 years old.

Four themes emerged from the analysis. Consistently, both groups had the same concepts and ideas. For each group, verbal transcriptions were coded and categorized into suitable themes. Each theme will be discussed separately.

Theme 1: Structured Training

All participants highlighted insufficient structured training on the SBAR as the main factor in low compliance among nurses. The current education was too brief and staff were unable to utilize it during clinical practice. They believed that without a structured training and follow up the new communication method would be no longer be practiced. They also commented that to change old traditions would require ample time and behavioural change. Below are some of the participants’ comments:-

“…Even though I’m senior but I was not taught on how to use SBAR in the clinical areas, and I’m very much comfortable with the current ways of communication especially during handover reports. I think that we were not given enough training and exposure to the usage of SBAR. We need a more practical session because by doing this then only we can change the old style of communication…”

“…”I do attend talk on Patient Safety Goal, but the information that I received is too little and they ask us to use SBAR when communicating with doctors via phone, but I feel without a proper practical session like CPR training, we cannot adopt it because it takes time for us to use and become an expert…”

“…We are nurses and from different backgrounds of teaching and communication was not taught in nursing school…”

From the discussion, participants wanted an innovative and new strategy in the learning process of effective communication.

Theme 2: Supervision and Mentoring

Participants stated that the organization must identify a capable person to be a supervisor or mentor for successful implementation. Many of the participants also expressed their grievances about the insufficient supervision from leaders.

“…For me, I only know the acronym of SBAR but how to use, no one really emphasizes it; proper coaching and guidance is not available for staff…”

An effective mentoring is key for the success of any learning process. Stakeholders are responsible to train and identify expertise prior to any implementation. The success of the program is totally dependent on the coaching and supervision that are provided by expert supervisors.
Theme 3: Change in Practice

Participants agreed that change in practice will happen if appropriate action had been in place and staff were given appropriate time for adaptation to the new environment. Change management will be successful if the structure and process were well disseminated to all staff in the organization. Training and change of practice were interrelated. A few participants had commented…

“…Definitely we will change our practice as long appropriate time frame is allocated for adaptation in the clinical areas…”

“…regarding the second patient safety goal “To improve effective communication”, I believe a structured planning definitely will be able to change staff mind set. We are nurses and from different backgrounds of teaching; and communication was not taught in the nursing school. Learning communication skills is something unique and needs time to adapt…”

Theme 4: Working as a Team

Communication is really important to all in healthcare, including medical and non medical personnel. The success of any new process directly reflects the teamwork approach.

“…Make it compulsory for all to follow this SBAR skill. It must be applied for all so that we can improve our communication skills. It must be in a team…”

“…My apology for this statement… leaders must be fully responsible for the success of any new project…if they did not bother with the implementation, definitely it will not be a success…”

“…I just want to say that do not blame us because there must be a directive from the top of management. Responsibility should go to all…”

The participants were very concerned about patient safety and they did realize one of the contributing factors for most unwanted events in the hospital was the lack of effective communication. It had to be done in a team and everyone is responsible for the implementation.

DISCUSSION

Generally, all participants highlighted that a structured training programme should be developed incorporating explicit models that include practical sessions and conducted by a skilled person. Effective exposure through innovative learning strategies would prepare staff mentally and physically for the new adaptation process. Participants also valued continuous monitoring and coaching strategies as a way to improve effective communication. The success of the standardized communication solely depends on collaborative team effort.

Limitations

Although the purpose of this qualitative research was to gain in depth understanding about the nurses’ opinion and suggestion for effective communication, the relatively small sample size and our recruitment from nursing services may limit the findings. Further research should include the whole population in the organization.

Recommendation

From this study, we have a few recommendations for future research. First the organization must have a strategic planning prior to any implementation. A standard lesson plan must be developed before any policy and guideline get implemented. The management should be stringent in selection of a mentors or supervisors and their effectiveness must be evaluated through feedback from staff.

CONCLUSION

In conclusion, the results of this qualitative study suggest a number of ways can be explored before implementing any new project in the hospital setting. Participants emphasized the need for a continuous training strategy and identifying elements for an effective and successful implementation. It is not only addressed in the standardized communication, but from this valuable discussion, we identified key points that are strategic and imperative for future sustainability of the practice among stakeholders including employees and employers.

Acknowledgement

We are very thankful to all participants who participated in these focus group discussions.

REFERENCES


ABSTRACT

Five moments hand hygiene (5MHH) is the utmost important preventive measure towards patient safety by all healthcare providers in managing hospitalized patients. Multi-modal strategies have been introduced by the World Health Organization (WHO) to ensure good compliance. Despite these strategies compliance is still low. Factors such as self-perception, lack of awareness, minimal facilities and lack of training, have been identified as causes of low compliance.

This study aimed to explore doctors’ perception on 5MHH compliance in one private hospital. A qualitative study design was used on the 17 consultant doctors from various disciplines. An interview session with semi structured open-ended questions was conducted with each participant. 11 Domains: Knowledge, social influence, belief about capabilities and consequences, perception, intention, environment/ facilities, goals, emotion, behaviour regulation and reinforcement for hand hygiene and other factors that may influence consultant’s practice were explained. Later, an interview session with individual consultants using a coding theme was held in order to explore the consultant’s self-perception that could lead to behaviour change towards 5MHH.

We found that clinicians’ compliance for 5MHH would increase concurrently with their levels of perception and knowledge.

Five Moments Hand Hygiene Acceptance and Compliancy Among Clinicians in a Private Hospital in Selangor

Norzana A. Rajak, SRN,¹ Hamidah Hassan, PhD, MSN, RN,¹ and Anjali Misra²

INTRODUCTION

Hand hygiene was introduced by Dr. Ignaz Semmelweis in 1840s after he realized that the increase of maternal death due to puerperal fever.¹ He was known as father of hand hygiene. He also introduced the technique of hand washing using chlorinated agent to physicians who delivered babies after conducting autopsies. This later resulted in reduction in fatality among mothers.

Hand hygiene is the simplest and most effective measure to prevent infections. It is the most effective preventive measure for hospital acquired infection (HAI)²,³,⁴,⁵ and is also cost effective.⁶

In 2005, the WHO introduced “Clean Care is Safer Care” campaign worldwide to combat HAI concentrating on the steps of hand hygiene practice.⁷ In 2009, the WHO revised a guideline for Patient Safety Goal on hand hygiene focusing on 5MHH in additional to steps in hand washing.⁷

The objective of Hand hygiene practice is to reduce the number of microorganisms on the skin and thus preventing HAI. WHO, had identified the 5 moments of contact where hand hygiene should be practiced which are before contact patient, before aseptic procedure, after contact with patient, after touch with patient’s surroundings and after dealing with body fluids.

Hand hygiene still remains as the gold standard in preventing HAI.⁸ It is the utmost important preventive measure towards patient safety during hospitalization.⁹ As healthcare providers are one of the modes of transmission for HAI¹⁰ stated that the mode of transmission of microorganism from Healthcare worker onto the patient had been distorted through practicing 5MHH. Failure in compliance results in an increase number of HAI.⁴

Many authors have reported that Clinicians have a low compliance to 5MHH.¹¹,¹² Reasons given were related to self-perception, lack of awareness, facilities, training and lack of knowledge.

Mc Law et al. conducted a cross sectional study on 1200 healthcare worker and found that poor attitude led to low compliance to hand hygiene.¹³

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Research has indicated clinicians have low compliance to hand hygiene especially on the moment before contact. Pyne stated that physicians still remain the lowest in compliance to hand hygiene compared to others Healthcare Personnel (HCP) and suggested that clinicians should be a role model in hand hygiene compliance.12

In contrast some studies have shown that clinicians have better compliance towards hand hygiene. According to Bukhari et al. in their study on to a group of HCP in Saudi Arabia physician compliance is higher compared to other professionals such as nurses and technicians in ICU settings however adherence to hand hygiene was low in other settings.14 A study in Barcelona, Spain noted that physician had higher compliance rate (24.7%) compared to nurses (22%).15 Tavolacci et al. compared knowledge among different categories on alcohol hand rub agents and found that physicians had a better knowledge compared to other HCPs.16

**Background**

In a private hospital in Selangor, a series of audit was conducted on all HCPs. The audit was run by the Infection Control Team to monitor hand hygiene compliance especially to the 5 moments of contact.

This study also aimed to explore levels of consultant’s self-perception towards the 5MHH and their compliance.

**METHODS**

**Study design**

This study used a case study design which to determine the level of compliance and perceptions among clinicians on the 5MHH practice.

**Sample and data collection**

The respondents of the study were 17 clinicians from various disciplines. All of them resident doctors and worked independently. They were from disciplines of general surgery, orthopaedic, ear nose throat surgery, ophthalmology, medicine, urology and cardiology.

**Measurements and Instrumentation**

An individual interview session using semi structured, open ended questionnaires was conducted using 11 domains: knowledge, social influence, belief about capabilities and consequences, perception, intention, environment/facilities, goals, emotion, behaviour regulation and reinforcement for hand hygiene. Data gained were kept confidential and used for research study only. All data gathered during the interviews were audio taped and final notes were taken according to the theme coding.

**Ethical consideration**

Approval to conduct this study was obtained from Research and Development Ethic Committee KPJ University College. The Medical Director of the hospital was informed. Clinicians participated on a voluntarily basis and consent was obtained from them to be involved in the study.

**Data analysis**

Data was analysed using coding themes and all data was collected during the interviews were transcribed verbatim for analysis.

**RESULTS**

There were three female and 15 male clinicians respondents. The age range of respondents was 38 – 55 years. All of them were residents of the hospital for more than 5 years and did their ward round twice per day. They came from different medical school backgrounds and institutional practices before joining this hospital.

**Knowledge on 5 moments of hand hygiene**

The respondents did agree on the important of hand hygiene but admitted that they had not received a formal training on hand hygiene before.

“...I do realize that the infection control officer really stressed on 5 moments of hand hygiene when I was doing my round but she mainly focused on nurses…”

“...I know about the 5 moments of hand hygiene, they are displayed in posters about…”

“...knew about hand washing but I did not remember on the moments…”

“...They came and audited me on hand washing occasionally but I was not aware that they were monitoring on the moments of hand hygiene…”

**Social/Professional Role and Identity**

Asked on the standard of hand hygiene practice guideline included in the management of patient, many respondents did not think that it related to them directly and they were aware that their practice was substandard compared to other HCP.

“...Our hospital only had 2 cases of surgical site infection in year 2014…”

**Beliefs about Capabilities and consequences**

Many of the respondents felt that hand hygiene is easy to practice and believed that patients could benefit
Five Moments Hand Hygiene Acceptance and Compliancy Among Clinicians

from it but they believed that they only need to practice it when they carried out a procedure on the patient and at the end of their round.

“…I do understand the patient will be free from infection but I already used a glove during my dressing.”

“…Do I need to wash my hands since I did not touch the patient?”

“…I did my hand washing at the end of my round before I write my notes…”

Perception on 5 moments of hand hygiene

Most respondents especially the general surgeons were aware that the patients are exposed to HAI if they did not the 5MHH. Physicians would strictly practice 5MHH if they were dealing with infectious cases.

“…I make sure that I use gloves when I do wound inspection…”

“…definitely, I will practice hand hygiene if I see my patient with infectious disease…”

Intentions to practise

A majority of respondents did agree to practise the 5MHH but they felt that it was really taking a lot of their time since they had a lot of patients to see.

“…I only wash my hands if contaminated with patient body fluid or secretion…”

“…I don’t have enough time since I have many patients to see in the wards and also need to see patients in clinic…”

Environment and facilities

Respondents were asked on the environment available to facilitate them for better compliance to 5MHH. They suggested that alcohol hand rub made available at the bed side or on round trolleys rather than placed outside the rooms as practiced currently was the best way to make them practise the 5MHH, this would be time saving and user friendly.

“…The disinfectant solution is available but I do not think it is suitably placed…”

“…I will use hand rub if it is easier to get; currently I need to go out from room if I want to use it…”

Social influences

Respondents were asked whether the actions of other HCPs impacted their hand hygiene practice but most of them stated that they were not influenced by them (the HCP).

Emotion

A majority of respondents gave the same answer when asked about their feelings towards 5MHH. They did believe in hand hygiene but did not really agree on the first moment since they believed hospital ventilation played a more important role in HAI.

Goals

In the practice of 5MHH, 14 of the respondents chose a high scale for the importance of 5MHH but they only would practise hand hygiene based on the situation that needed it such as after contact with body fluids. Three respondents put a very high score in consistently practising 5MHH moments of hand hygiene but admitted to not complying with the first moment which is before contact with patient.

“…I would make sure that I do my hand washing each time I had contact with patient body fluids…”

Many respondents believed that their practice was to prevent themselves from HAI rather than for patient safety.

Behavioural regulation

Respondents agreed that they needed to improve their daily practice on hand hygiene and insisted that nurses should remind them during rounds.

“…I’ll really appreciate if the nurse could remind me on the hand hygiene practice during my round…”

Limitations

This study focused only on one private hospital and specifically on one group of HCPs. Since all resident clinicians were working as an independent business partners with the hospital, the infection control team had difficulty in ensuring these clinician comply with the 5MHH. A directive from Infection Control Committee is needed for them to adhere to the guideline.

DISCUSSION

Patients Safety Goals including hand hygiene was introduced in 2008 in this hospital. All this while trainings were more focused on nurses and allied health personnel but there was minimal exposure for clinicians. Our result showed that clinicians were aware of the importance of 5MHH in managing their patients. They also had knowledge on hand hygiene but their compliance to the practise of the 5MHH was the lowest compared to that of other HCP. This study also found that clinicians did not receive a dedicated formal training. Even though some of them were aware of the
posters and signage displayed in the wards that detailed the steps of hand washing and the 5MHH enforcement strategies should be implemented.

Most clinicians did not perform hand hygiene on first moment which is before contact with the patient. A majority of them only practise hand washing at the end of their ward rounds. It showed that their perception was that hand washing was to protect them from any microorganism rather than to prevent patients from acquiring HAI. This perception needs to be changed in order for them to realize that the impact on compliance 5MHH is a very important preventive measure.

There are several factors that may influence clinicians from adherence to 5MHH namely lack of training, self-perception, time consuming and lack of facilities, even though they had a good knowledge of hand hygiene.

CONCLUSIONS

In developing a safety culture among all HCPs, enforcement of strategies in 5MHH is the main key to ensuring clinician’s behaviour change and adherence to the practise of 5MHH.

Benedetta Allegranzi et al. had urged that multimodal strategies implemented through health promotion would help in improving hand hygiene compliance among medical personnel. This will enable them to change their perception and their practise of hand hygiene.

Pittet also emphasized on introducing a multimodal programme on HCP to help in behaviour change towards 5MHH practise. This study found that clinicians had good knowledge of 5MHH but their perceptions had prevented them from adherence to the practise. In addition, continuous training should be provided in order to change their perception and intuition to change their practice. An enhancement of the multimodality strategies that are included in the WHO guideline should be applied to this group of clinicians. A safe environment will be in place for us to deliver high quality care to our clients as stated in our hospital’s mission.

REFERENCES

Review of Cochlear Implantation at KPJ Tawakkal Specialist Hospital

Ezulia T¹ and Saim L, MD, FRCS, MSurg ORL², ³

ABSTRACT
Patients with severe to profound sensorineural hearing loss, who have received cochlear implant followed by intensive audiological and speech rehabilitation are able to acquire or regain hearing and develop normal or near normal speech. In Malaysia, to date there are a total of 503 recipients of cochlear implantation, most of which were done in public hospitals. In KPJ Group of hospitals, cochlear implantation started in Tawakkal Specialist Hospital in November 2012. Since then, we have had 6 cochlear implant recipients (a total of 8 ears). We review all these cochlear implantation cases that were done in KPJ Tawakkal Hospital. We collected all data of patients who underwent cochlear implantation from period of November 2012 till July 2014. Amongst them, there were 3 males and 3 females. Three patients were implanted in the right ear only and 1 patient had left ear implantation only. Two of them received bilateral implants. Their ages ranged from 2 to 35 years old. Three of them were Malaysians. The other 3 were foreigners; 2 from Brunei and 1 from Indonesia. There was no surgical complication. Cochlear implant recipient requires audiology and speech rehabilitation. In KPJ Tawakkal Specialist Hospital, these services are provided by the locum speech therapist and audiologists. KPJ Tawakkal Specialist Hospital is one of the very few private hospitals that offer cochlear implantation. It has the potential to become the centre of excellence for cochlear implantation in private hospitals. This program can be improved if we have permanent audiologists and speech therapists. These facilities are not only beneficial for cochlear implantation programme but also for newborn hearing screening and other diagnostic services. KPJ Medical Journal 2016; 6:41–43

Keywords: sensorineural hearing loss, cochlear implant, private hospitals, rehabilitation

INTRODUCTION
Hearing impairment is the most frequent sensory deficit in human populations, affecting more than 250 million people in the world. Consequences of hearing impairment include inability to interpret speech sounds, delay in language acquisition and reduced ability to communicate. It also leads to educational disadvantage, social isolation and stigmatisation.¹ Hearing aids can be used effectively for patients with moderate to severe hearing loss. However for individuals with severe to profound sensorineural hearing loss, the only clinically available treatment is cochlear implant.² Cochlear implant operations have been done to over 150,000 people in both children and adults worldwide.³ The first Cochlear Implant surgery in Malaysia was done in Pusat Perubatan University Kebangsaan Malaysia in December 1995. There has been a total of 510 recipients of cochlear implantation in Malaysia from the year 1995 – 2013. Most of the cases were done in public hospitals as very few private hospitals in Malaysia offer a cochlear implantation programme. In KPJ Healthcare group of hospitals, cochlear implantation was started in KPJ Tawakkal Specialist Hospital in October 2012. In this article we review the demographic pattern of cochlear implant recipients in KPJ Tawakkal Specialist hospital and the complications and outcomes of cochlear implantation surgery.

METHODOLOGY
We collected all data of patients who underwent cochlear implantation in KPJ Tawakkal Specialist Hospital from November 2012 till July 2014. From the
data, we have gathered the total numbers of patients and their demographic details such as sex, age at time of operation and their nationality. We reviewed the causes of hearing loss, which rendered them candidates for cochlear implant. We also collected data of the side of operation; unilateral or bilateral, complication of surgery and postoperative outcomes.

RESULTS

There were a total of 6 recipients (8 ears). Amongst them, there were 3 males and 3 females. There were 3 children and 3 adults. The youngest is 2 years old while the oldest patient is 35 years old. Three patients were implanted in the right ear only and 1 patient had left ear implantation only. Two of them received bilateral implants. Three of them were Malaysians. The other 3 were foreigners; 2 from Brunei and 1 from Indonesia.

Causes of hearing loss in these patients were divided into congenital and acquired. Five out of 6 patients had congenital hearing loss. Three of the 5 patients with congenital hearing loss presented with severe to profound sensorineural hearing loss. The other 2 patients had moderate sensorineural hearing loss since childhood and were on hearing aid but later progressed to severe hearing loss. One of them had early onset presbycusis.

Intraoperatively, all of these patients received Cochlear Nucleus with Contour Advance Electrode from Cochlear Limited. Full insertions of the electrodes were achieved in all patients. Neural Response Telemetry (NRT) was tested during the surgery and the cochlear implant was confirmed effectively stimulating the hearing nerve fibers in the inner ear.

There was no surgical complication in these patients. None of them developed facial nerve palsy or perilymph leak. They were discharged 2 days after the operation. There was no prolonged hospital stay.

Postoperatively, patients were seen 3-4 weeks after surgery for the first “switch on” of the cochlear implant. This process took about 2-3 sessions before the mapping is stable. The 3 patients who were from overseas were required to come back for these sessions.

Table 1 — showing side of operation, age of patient at time of surgery, nationality and cause of hearing loss

<table>
<thead>
<tr>
<th>Patient No.</th>
<th>Side of Operation</th>
<th>Age of patient at time of surgery</th>
<th>Nationality</th>
<th>Cause of hearing loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bilateral</td>
<td>5</td>
<td>Brunei</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
<tr>
<td>2</td>
<td>Right</td>
<td>13</td>
<td>Malaysia</td>
<td>Moderate congenital sensorineural which progressed to severe hearing loss</td>
</tr>
<tr>
<td>3</td>
<td>Right</td>
<td>35</td>
<td>Malaysia</td>
<td>Early onset presbycusis</td>
</tr>
<tr>
<td>4</td>
<td>Bilateral</td>
<td>2</td>
<td>Brunei</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
<tr>
<td>5</td>
<td>Right</td>
<td>4</td>
<td>Malaysia</td>
<td>Congenital severe to profound sensorineural hearing loss</td>
</tr>
<tr>
<td>6</td>
<td>Left</td>
<td>23</td>
<td>Indonesia</td>
<td>Moderate congenital sensorineural which progressed to severe hearing loss</td>
</tr>
</tbody>
</table>

DISCUSSION

Children and adults who have severe to profound sensorineural hearing loss are the candidates for cochlear implants. As of December 2010, about 219,000 people worldwide had received cochlear implants.\(^4\) In Malaysia, there are a total of 503 cases of cochlear implantation. Most of these cases were done in public hospitals. KPJ Tawakkal Specialist Hospital is one of the very few private centres that offer cochlear implantation programme. The first cochlear implantation in KPJ Tawakkal Hospital was started in October 2012. Since then, we have had 6 recipients (a total of 8 ears) of cochlear implantation. Although the number is small, we have shown good results. All of the recipients did not have any intraoperative complications such as facial nerve injury or perilymph leak. The average post operative hospital stays for all patients were 2 days. The outcomes of cochlear implant in our initial 6 patients were very encouraging. After vigorous mapping and speech therapy sessions they were able to develop normal or near normal verbal communications. The 3 children who received cochlear implant were able to recognize speech after 6 months. All of them were able to communicate verbally with at least 2-3 words sentences. As for the 3 adults who received cochlear implants, they were able to achieve normal or near-normal open speech after 6 months.

Rehabilitation for children and adults post cochlear implantation is an accepted critical part in determining the outcome of cochlea implantation. Cochlear implant
Review of Cochlear Implantation at KPJ Tawakkal Specialist Hospital

Recipients require both audiology and speech therapy as part of the rehabilitation. They are taught how to use the implant and how to respond to the sounds they are receiving. About 3-4 weeks after surgery, the recipient returned to the hospital to be fitted with the external parts—the microphone and speech processor—and to “switch on” and program (called mapping) the implant. Additional visits are needed for activating, adjusting, and programming the various electrodes that have been implanted.

In KPJ Tawakkal Specialist Hospital, locum audiologists and speech therapists provide both of the mapping and speech therapy services. It is ideal to have permanent speech therapist and audiologist in our centre to rehabilitate cochlear implant recipients.

Among 6 of our cochlear implant recipients, 3 were foreigners from regional neighbours. Two were from Brunei and 1 from Indonesia. All of the recipients regardless of their home countries came to KPJ Tawakkal Specialist Hospital for the mapping sessions. Overseas patients are required to come back for the mapping sessions which are done monthly until mapping was stable. On the other hand, speech therapy is a more intensive rehabilitation. It requires longer follow up and weekly sessions. All of the overseas patients underwent the speech therapy sessions in their home countries. Therefore before decision for surgery is made for the overseas candidates, it is important for the surgeon to make sure these patients have speech therapy services at their countries to do the necessary rehabilitation for them.

CONCLUSION

KPJ Tawakkal Specialist Hospital is one of the few private hospitals in Malaysia that offers cochlear implantation. It has the potential to become a regional leader for cochlear implantaion. This program can be improved if we have permanent audiologists and speech therapists working as a team in a dedicated centre of excellence. These services will not only be beneficial for cochlear implantation programme but also provide the measures for newborn hearing screening and other audiology and speech services.

REFERENCE

4. NIDCD Fact Sheet: Cochlear Implants NIH Publication No. 11-4798.
ABSTRACT
Objectives: Keratosis obturans (KO) is the term used when there is accumulation of desquamated keratin in the external auditory canal (EAC). This is important to differentiate from external auditory canal (EAC) cholesteatoma (EACC) which is characterized by invasion of squamous tissue from the external ear canal into a localized area of bone erosion. In this case series, we aimed to determine the clinical characteristics most important to its clinical management.

METHODS: Retrospectively, we reviewed 6 cases of Keratosis obturans (KO) ranging from 5 to 30 years old at KPJ Seremban Specialist Hospital. Clinical data were reviewed for the history, presentation, and physical examination findings.

RESULTS: Six patients were analysed. Males and females were equally involved. All the patients presented with severe otalgia and sensation of blocked ear. 5 patients only had keratin plug occluding the ear canal and widening of the canal. Only 1 patient had erosion of the bony ear canal over the posteroinferior portion. The left ear was involved 3 times as frequently as the right. All patients underwent surgical intervention to remove the obstruction by desquamated keratin. One patient with posteroinferior bony ear canal erosion underwent further extensive surgical intervention which required removal of abnormal bone involved. No recurrences were noted on follow up of remaining 5 patients.

CONCLUSION: It is essential to differentiate keratosis obturans from external auditory canal cholesteatoma as recognition of this entity and its possible extension is important because it may influence clinical management. KPJ Medical Journal 2016; 6:44–47

INTRODUCTION

Keratosis obturans (KO) is defined as the presence of keratotic mass of desquamating squamous epithelium in the bony part of external auditory canal (EAC). It is mainly seen in the posterior or inferior part of EAC. Typically, the lesion is limited to the canal without bone destruction. It is a rare and uncommon condition. It has been proposed by authors that pathogenetic mechanism of KO is due to abnormal epithelial migration in the EAC that is responsible for the accumulation of desquamating squamous epithelium. Usually, patients present with severe otalgia and conductive type of deafness.

External auditory canal cholesteatoma (EACC) result from invasion of squamous tissue into a localized area of the bony canal causing osteitis in the canal wall. It has overlapping features with KO and recognition of this entity is important because it may influence clinical management.

The purpose of doing this case review is to analyse a series of cases for clinical characteristics of KO in terms of age distribution, presenting symptoms, diagnosis and its management. We also wanted to identify those aspects of KO from EACC that could lead to complications. 6 cases were retrospectively reviewed and described in this report to share our experience.

MATERIALS AND METHODS

The records of the 6 patients between October 2013 to July 2014 that presented to Ear, Nose, Throat, Head and Neck Clinic at KPJ Seremban Specialist Hospital with

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history of severe otalgia, sensation of blocked ears, impacted cerumen on the ear canal and conductive type of hearing loss on clinical examination were analyzed retrospectively. The diagnosis of impacted ear wax was mainly clinically made after a thorough clinical examination. All 6 of these patients were clinically examined thoroughly. However due to severe otalgia, these 6 patients were scheduled for surgical removal under general anaesthesia (GA). The EAC, tympanic membrane (TM), middle ear cavity and mastoid were examined under direct illumination after removal of wax under GA.

RESULTS AND OBSERVATIONS

There were 3 females and 3 males (M:F; 1:1) aged between 5 years to 30 years. All the 6 patients underwent surgical removal of wax under general anaesthesia (Table 1). Cases 1, 2, 3 and 4 showed inflammation of the EAC and widening of the bony canal with no bony erosions. Case 5 had only EAC inflammation and keratin debris adherent to the periphery of the ear canal. Case 5 developed otorrhea as well during the treatment process but this subsided after removal of the keratin plug/debris. Case 6 had keratin debris extending into the middle portion of the ear with erosion of the bony canal at the posteroinferior portion and perforation of the left TM. After removal of the keratin debris Case 6 still had persistent ear discharge, and later this patient was found to have cholesteatoma. This patient underwent a further extensive surgical intervention which required removal of abnormal bone involved. No recurrences were noted on follow up of the remaining 5 patients.

DISCUSSION

Keratosis obturans (KO) and External Auditory Canal Cholesteatoma (EACC) are 2 different clinical and pathologic entities introduced by Schofield in 1893. Both KO and EACC are rare. Piepergerdes et al reviewed and further highlighted the differences between the two. KO is mainly a chronic desquamative process of ear canal and EACC is desquamated epithelium in the external auditory canal with associated periostitis and bone erosion.

KO is closely related to EACC and both have overlapping signs and symptoms and often, the diagnosis may be overlooked.

The exact etiopathogenesis of both KO and EACC are unclear. Several theories have been proposed. For KO, Seung Ho-Shin et al suggested that abnormal epithelial migration led to its overproduction and inability of the canal to clean itself. As for EACC, Brookes GB et al and Persaud et al suggested that a minor trauma to EAC could lead to local inflammation and ulceration, thus causing obstruction of the canal. This could lead to desquamation of the epithelium and the collection of impacted squamous debris ultimately modify the canal lining causing local periostitis and osteonecrosis and leading to cholesteatoma formation.

It is essential to differentiate the key features of both these entities. Table 2 summarizes their identification features.

The common initial presentation is similar to that of impacted wax in the EAC. Therefore, the diagnosis of KO or EACC cannot be presumed in the first initial clinical visit itself. However, pain and discomfort is relatively more in KO. All 4 of our patients diagnosed with KO had similar symptoms of severe otalgia, inflammation of EAC with widening of bony canal and no bone erosion. Case 5 had inflammation of the EAC with no bony erosion as well but presented with otorrhea, probably due to chronic infection of the keratotic mass which is not an uncommon event.

Case 6 had history of impacted wax for quite some time, he remained undiagnosed in early stages due to lack of follow up and now had erosion over the bony part of left EAC and was diagnosed with EACC (Table 1). The erosion and widening of the bony canal was probably due to faulty epithelial migration which accumulated causing obstruction of the canal and eventually leading to erosion of the part of the bony canal. He had to undergo further surgical intervention.

In all the 6 cases, the diagnosis of KO and EACC were not suspected on the first visits as their symptoms were more attributed to the common condition of ear wax with otitis externa. Diagnosis of KO and EACC

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Gender</th>
<th>Site</th>
<th>Otalgia</th>
<th>Otorrhea</th>
<th>Hearing level</th>
<th>Itching</th>
<th>Tinnitus</th>
<th>CT findings if done</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>Left</td>
<td>+</td>
<td>_</td>
<td>_</td>
<td>+</td>
<td>_</td>
<td>Not required</td>
</tr>
<tr>
<td>2</td>
<td>Male</td>
<td>Right</td>
<td>+</td>
<td>_</td>
<td>Mild</td>
<td>+</td>
<td>_</td>
<td>Not required</td>
</tr>
<tr>
<td>3</td>
<td>Female</td>
<td>Left</td>
<td>+</td>
<td>_</td>
<td>Mild</td>
<td>+</td>
<td>_</td>
<td>Not required</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>Left</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>_</td>
<td>Not required</td>
</tr>
<tr>
<td>5</td>
<td>Female</td>
<td>Right</td>
<td>+</td>
<td>+</td>
<td>Mild</td>
<td>+</td>
<td>_</td>
<td>Not required</td>
</tr>
<tr>
<td>6</td>
<td>Male</td>
<td>Left</td>
<td>+</td>
<td>+</td>
<td>Mild</td>
<td>On and off</td>
<td>Erosion left side</td>
<td></td>
</tr>
</tbody>
</table>

+ : present; - : not present; CT : computed tomography

Table 2 — Comparison of Keratosis Obturans and External auditory Canal Cholesteatoma
Table 2 — Comparison of Keratosis Obturans and External Auditory Canal Cholesteatoma

<table>
<thead>
<tr>
<th>Aetiology</th>
<th>Keratosis Obturans (KO)</th>
<th>External auditory canal Cholesteatoma (EACC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical symptoms and findings</td>
<td>Abnormal epithelial migration</td>
<td>Abnormal epithelial migration leading to bone involvement</td>
</tr>
<tr>
<td>Severe otalgia</td>
<td>Chronic and dull pain</td>
<td></td>
</tr>
<tr>
<td>Otorrhea (rare)</td>
<td>Otorrhea</td>
<td></td>
</tr>
<tr>
<td>Conductive hearing loss</td>
<td>Normal hearing/Mild hearing loss</td>
<td></td>
</tr>
<tr>
<td>Younger ages</td>
<td>Older populations</td>
<td></td>
</tr>
<tr>
<td>Occasionally bilateral</td>
<td>Usually unilateral</td>
<td></td>
</tr>
<tr>
<td>Sensation of blocked ear</td>
<td>Itchiness</td>
<td></td>
</tr>
<tr>
<td>Pathology</td>
<td>Keratin plug occluding the canal</td>
<td>Keratin in random pattern</td>
</tr>
<tr>
<td>TM thickened</td>
<td>TM normal</td>
<td></td>
</tr>
<tr>
<td>Ear canal ballooned (widening)</td>
<td>Localized osteitis/erosion ear canal usually posteroinferior part</td>
<td></td>
</tr>
<tr>
<td>Hyperemia of the canal, sometimes with granulation</td>
<td>Sequestration of bone</td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>Removal of plug</td>
<td>Surgical removal</td>
</tr>
<tr>
<td>Done surgically if severe pain intolerable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May need regular aural toileting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

became more apparent upon complete removal of the ear wax. Clinical suspicion is the key to diagnosis. Presence of erosions of bone of EAC particularly of the inferior and posterior parts along with keratin plug should always raise suspicion of EACC and is an indication for diagnostic imaging with computed tomography of the temporal bone.²,¹¹

Finally, the management of KO requires aggressive and frequent aural toileting. Aural toileting under general anaesthesia may sometimes be necessary due to extensive involvement of the ear canal and severe otalgia.⁹,¹¹ Careful inspection is required following cleaning to exclude the presence of tympanic membrane perforation, bony canal erosion, or external canal cholesteatoma.

CONCLUSION

Regular follow up of patients presenting with a simple recurrence of impacted ear wax is necessary to prevent further recurrences or EACC development in neglected or long standing cases. Furthermore, it is essential to distinguish EACC from KO to ensure correct management of these entities.

REFERENCES

ABSTRACT
Lung cancer represents a leading cause of cancer death. There are many instances where underlying lung cancer becomes detectable via pleural deposits and malignant pleural effusions. In such cases, the tumour presents at an advanced stage, and the patient may not be physically able to undergo a lung tissue biopsy procedure.

However, in these cases, a positive pleural sample, aspirated using less invasive modalities may adequately answer the clinical query as to the nature of the lung cancer. Usage of immunohistochemistry on the prepared cell block will be able to differentiate between non-small cell and small cell lung cancers. Furthermore, the diagnostic cytologic sample can be further used for epidermal growth factor receptor (EGFR) mutation testing.

We present a case series of 4 patients at our practice where pleural aspirates had better tumour yield in comparison to the companion bronchial and pleural biopsies. Immunohistochemistry was performed in each case to provide a definitive diagnosis of lung cancer. Three of the 4 cases had good specimen and were utilised for EGFR mutation analysis.

These cases illustrate the utility and importance of pleural aspirates as a key diagnostic modality in managing lung cancers in cases where bronchial or pleural tissue biopsies may be of lower diagnostic utility. *KPJ Medical Journal* 2016; 6:48–51

Keywords: Pleural cytology, EGFR mutation

INTRODUCTION
KPJ Lablink’s Cytopathology Department processes paraffin cellblock samples for further immune-histochemical investigations. There have been several cases where the cytologic material obtained possesses more viable tumour cells in comparison to the corresponding pleural biopsy tissue. In these cases, diagnosis of metastatic carcinoma was possible purely based on pleural cytology.

The aim of this pilot study is to demonstrate the effectiveness of pleural utilising pleural fluid samples in ancillary immune-histochemical and EGFR molecular analysis.

MATERIALS AND METHODS
We received 4 cases between the months of February 2014 to July 2014. The pleural fluid material was read and interpreted as being positive for malignancy. Further clinical correlation determined that the likely primary was pulmonary in origin. The presence of a good cell yield enabled the generation of an optimal paraffin cell block sample for immune-histochemical analysis.

We utilised the traditional method of cell block preparation. This involved utilising 3-5 ml of specimen fluid into a test tube. The mixture is spun at 950rpm for 5 minutes in a centrifuge. The supernatant was discarded and the resultant concentrated cell button was placed into a histology processing cassette. Each sample was processed in a similar manner as a standard tissue biopsy and was stained with Haematoxylin and Eosin (H&E). The H&E specimen was evaluated for further immune-histochemical staining.

The immune-histochemical panel needed to be comprehensive, enabling preservation of tissue material for further molecular investigations. The panel of choice in definitively determining non-small cell pulmonary adenocarcinoma consists of CK 7, CK 20 and TTF-1. Three cases were sent for EGFR mutational analysis to an external referral center.

RESULTS
Immunohistochemistry performed on 3 cases confirmed the tumour cells to be non-small cell pulmonary adenocarcinoma. Immunohistochemistry was not performed one case due to limited tissue material (Fig. 1).

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Fig. 1. Morphological and immune-histochemical expression pattern of metastatic non-small cell pulmonary adenocarcinoma in pleural fluid cytological sample

Legend:

1. Pleural cytologic material reveals a dual cell population comprising reactive mesothelial cells and malignant cells with enlarged nuclei and vacuolated cytoplasm (arrow) - PAP stain x 200.

2. High power image of malignant cells with hyper chromatic nuclei, and vacuolated cytoplasm - PAP stain x 400.

3. Paraffin cell block mirroring the dual cell population seen in the cytologic sample (arrow) - H&E x 200.

4. Enlarged, malignant cells seen in a paraffin cell block sample displaying features of enlarged nuclei and prominent nucleoli (arrow) - H&E x 400.

5. CK7 immunohistochemical stain exhibiting prominent membranous and cytoplasmic positivity - IHC x 200.

6. TTF-1 immunohistochemical stain exhibiting prominent nuclear positivity - IHC x 200.
EGFR gene encodes a transmembrane growth factor receptor with tyrosine kinase activity that regulates cell proliferation and survival by activating downstream Ras/Raf/Map kinase pathways. Two of the 3 cases revealed the following mutation profile: Mutation [L858R] was detected in exon 21 of EGFR gene (Table 1).

**Table 1 — Immuno-histochemistry (IHC) and molecular analysis on cases of non-small cell lung carcinoma, detected on pleural fluid cytology**

<table>
<thead>
<tr>
<th>Case</th>
<th>Clinical impression</th>
<th>Cell block</th>
<th>IHC</th>
<th>EGFR mutation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Non-small cell lung carcinoma</td>
<td>YES</td>
<td>NOT PERFORMED</td>
<td>Mutation [L858R] was detected in exon 21 of EGFR gene</td>
</tr>
<tr>
<td>2</td>
<td>Non-small cell lung carcinoma</td>
<td>YES</td>
<td>PERFORMED</td>
<td>NOT REQUESTED</td>
</tr>
<tr>
<td>3</td>
<td>Non-small cell lung carcinoma</td>
<td>YES</td>
<td>PERFORMED</td>
<td>Mutation [L858R] was detected in exon 21 of EGFR gene</td>
</tr>
</tbody>
</table>
| 4    | Non-small cell lung carcinoma | YES        | PERFORMED  | No mutations were detected in exon 21 of EGFR gene

**DISCUSSION**

In patients with advanced non-small cell lung cancers, harbouring an activating mutation in the tyrosine kinase (TK) domain of the EGFR, targeted treatment is available in the form of the EGFR TK inhibitors (TKIs) gefitinib and erlotinib. 

Activating somatic mutations in the EGFR gene conferring sensitivity to EGFR TKIs were first reported in 2004. Since then, the efficacy of first-line gefitinib and erlotinib in patients with EGFR mutation-positive advanced NSCLC has been demonstrated in a number of Phase III trials. In the Iressa Pan-Asia Study, progression-free survival (PFS) was significantly longer with gefitinib than carboplatin/paclitaxel for patients whose tumours harboured activating EGFR mutations. In patients with wild-type EGFR, carboplatin/paclitaxel was associated with significantly longer PFS than gefitinib. The conformational change seen in the TK domain of mutated EGFRs increases the activation of the domain and its affinity for ATP (and EGFR TKIs) compared with wild-type EGFR. The resulting increase in binding of EGFR TKIs produces greater inhibition of the domain and blocking of signal transduction pathways implicated in the proliferation and survival of cancer cells. Gefitinib also improved PFS versus chemotherapy in two Phase III trials performed solely in patients with EGFR mutation-positive advanced NSCLC. In addition, in two Phase III erlotinib trials that recruited EGFR mutation-positive patients, PFS was significantly increased with first-line erlotinib relative to chemotherapy. As a result of these data, the accurate identification of patients who might benefit from EGFR TKI therapy has become an important step in the treatment-decision pathway for advanced NSCLC.

Mutations associated with enhanced sensitivity to EGFR TKIs are found in exons 18–21 of the TK domain of EGFR. Two types of mutation—short in-frame deletions in exon 19, clustered around the amino-acid residues 747–750 and a specific exon 21 point mutation (L858R)—have been reported to comprise up to 90% of all activating EGFR mutations. Other activating mutations include point mutations in exon 18 (including mutations in codon 719) and point mutations and in-frame insertions in exon 20 (including T790M). The prevalence of EGFR mutations differs according to ethnicity; approximately 10–12% of non-Asian patients with advanced NSCLC harbour these mutations compared with 30–40% of Asian patients.

Historically, the standard for EGFR mutation testing involved direct sequencing of DNA extracted from samples of tumour tissue gathered during biopsy or resection, usually in the form of formalin-fixed paraffin-embedded (FFPE) diagnostic blocks. Direct sequencing, however, has low sensitivity (only detects mutations when sufficient levels of mutant DNA are present), can be complex and time-consuming, and is not standardised in terms of laboratory practice. A number of alternative methods for mutation testing have been developed and used over recent years, many with improved sensitivity and turnaround times. Another area of active research has been the evaluation of alternative sources of tumour material.

As many patients with lung cancer are not identified until they have advanced disease, the procedures required to obtain a tumour biopsy sample for diagnosis may not always be possible due to co-morbidities or other reasons. Instead, cytology samples can be collected as they are adequate for the diagnosis and staging of the disease, and the procedures used to obtain these samples are generally less invasive than those used to obtain a biopsy sample. In this regard, the use of cytology samples collected for diagnostic purposes or as a result of disease complications (eg, pleural effusion (PLE)) has attracted particular attention.

Pleural cytology for detection of EGFR mutations has been relatively widely investigated. Cytology samples obtained via these techniques were successfully assessed for EGFR mutations using direct sequencing, Other studies have reported the successful use of EBUS-FNA and/or EUS-FNA samples with real-time PCR, COLD-PCR, PNA-locked nucleic acid (LNA) PCR clamp or loop-hybrid mobility shift assay.
The ability to perform these additional investigations using the pleural cytological samples were of great utility in patients where a lung biopsy may have not easily obtainable. The clinicians were hitherto unaware that further investigations could be extrapolated using the cytology sample. As such, this exercise was both beneficial to patient and to our department.

**CONCLUSION**

This is a pilot study which we intend to expand further. The future incorporation of molecular testing in-house will enable easier access and a more controlled operation of EGFR molecular testing. The results of this study was certainly rewarding for us and beneficial to both clinician and patient.

There is a certain degree of skepticism towards cytology as a adjunct to the tissue biopsy. However, there are cases where cytologic material generates greater cellular yield. The ability to perform additional immune-histochemical and molecular tests enables an optimal and effective interpretation of the nature of the malignant process.

**REFERENCES**

Non-Neonatal Spontaneous Gastric Rupture: A Case Report and Literature Review

Ngun Kok Weng, MBBS, FRCS

ABSTRACT
This is a case report of an idiopathic gastric rupture in a 4-year-old girl who had sudden abdominal pain followed by acute gastric rupture about 21 hours after the initial pain commenced. She died despite surgery. A review of the literature is done.

INTRODUCTION
Acute gastric rupture following acute gastric dilatation in non-neonatal children is rare, has a rapid clinical course and associated with a high mortality rate. A search on the internet reveals that there are only 20 cases reported worldwide in the medical literature, 21 including this. There is only one other reported case in Malaysia. I have excluded three other reports as these were complicated by the presence of other diseases.

CASE REPORT
A 4 year 8 month old girl was admitted for abdominal pain associated with abdominal distension and vomiting. An abdominal x-ray revealed severe gastric distension but no perforation. She was treated symptomatically with naso-gastric suction and intravenous hydration. She recovered and was discharged 4 days later. The cause of this was attributed to an idiosyncratic reaction to an anti-spasmodic medication given to her by her family practitioner.

She was well until 4 months later when she presented again with abdominal pain and vomiting that started 5 hours earlier. The abdomen was distended but plain x-ray imaging did not show any perforation. However the stomach was again seen to be severely distended. She was admitted for treatment with naso-gastric suction and intravenous hydration. Her condition suddenly took a turn for the worse about 16 hours after admission as she started to show signs of tachycardia, tachypnoea and shock. A repeat abdominal x-ray showed massive pneumo-peritoneum. After resuscitation, she was immediately brought to the operation theatre for exploratory laparotomy.

At laparotomy, the peritoneal cavity was contaminated mainly with light fibrinous exudate and with little if any food soiling. The cavity was surprisingly clean with no sero-purulent adhesions and no reactive changes in the large or small intestines. This was in keeping with a very recently perforated viscus. The usual sites of gastro-intestinal tract perforation (viz. appendix, duodenum and biliary tree) did not show any sign of disease. It was upon further exploration behind the lesser sac that a large perforation along the greater curvature in the fundus of the stomach was discovered. The perforation measured about 2+ cm, had a soft pliant edge and did not show gross evidence of any disease process, including ischaemia. The edge was trimmed and the perforation repaired with Vicryl® sutures. The operation was relatively straightforward and without difficulty. No other intra-abdominal disease was found.

The histology report of the trimmed perforated edge did not reveal any known disease entity.

POST-OPERATIVELY, the patient was managed in the intensive care unit but she succumbed to her illness about 16 hours after surgery.

REVIEW OF LITERATURE AND DISCUSSION
The stomach is a tough distensible hollow organ which does not rupture easily unless challenged with a disease process or a severe rise in intra-gastric pressure e.g. distension secondary to distal obstruction.

In adults, gastric perforations are usually secondary to a disease process, most commonly a carcinoma or peptic ulcer disease.

In children, gastric perforations are very rare apart from the well-documented cases occurring in neonates who are frequently premature, have low birth weights and has had asphyxia as a predisposing cause.

In the non-neonate, gastric perforation is the rarest, and lacks any definite identifiable cause, apart from the associated acute gastric dilatation whose pathophysiology itself is not clear. It has been suggested and quoted by several papers that spontaneous...
Non-Neonatal Spontaneous Gastric Rupture: A Case Report and Literature Review

Table 1 — Cases of Non-Neonatal Spontaneous Gastric Rupture (Adapted from Libeer et al.²)

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Sex</th>
<th>Site of Rupture</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigeta – 1981</td>
<td>2 years</td>
<td>F</td>
<td>Lesser curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Sanada – 1983</td>
<td>2 years</td>
<td>F</td>
<td>Not Described</td>
<td>Not Described</td>
</tr>
<tr>
<td>Yokoyama – 1984</td>
<td>1 year</td>
<td>M</td>
<td>Corpus</td>
<td>Died</td>
</tr>
<tr>
<td>Yokoyama – 1984</td>
<td>2 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Sakai – 1987</td>
<td>4 years</td>
<td>F</td>
<td>Not Described</td>
<td>Not Described</td>
</tr>
<tr>
<td>Asakura – 1987</td>
<td>4 years</td>
<td>F</td>
<td>Not Described</td>
<td>Not Described</td>
</tr>
<tr>
<td>Mitani – 1990</td>
<td>4 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Sato – 1991</td>
<td>3 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Fukada – 1993</td>
<td>1 year</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Adachi – 1998</td>
<td>2 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Adachi – 1998</td>
<td>4 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Survived</td>
</tr>
<tr>
<td>Shimizu – 2003</td>
<td>3 months</td>
<td>F</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Soong – 1996</td>
<td>5 years</td>
<td>F</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Qin – 2000</td>
<td>4 years</td>
<td>F</td>
<td>Greater curvature</td>
<td>Brain impairment</td>
</tr>
<tr>
<td>Qin – 2000</td>
<td>12 years</td>
<td>F</td>
<td>No surgery</td>
<td>Died</td>
</tr>
<tr>
<td>Qin – 2000</td>
<td>7 months</td>
<td>F</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Libeer – 2007</td>
<td>3 years</td>
<td>F</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Salerno – 2014</td>
<td>5 years</td>
<td>ND</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Aroona – 2014</td>
<td>2 years</td>
<td>M</td>
<td>Lesser curvature</td>
<td>Brain impairment</td>
</tr>
<tr>
<td>Vincenzo – 2014</td>
<td>2 years</td>
<td>M</td>
<td>Greater curvature</td>
<td>Survived</td>
</tr>
<tr>
<td>Ngun – 2015</td>
<td>4 years</td>
<td>F</td>
<td>Greater curvature, posterior</td>
<td>Died</td>
</tr>
</tbody>
</table>

rupture in non-neonates may have been preceded by ingestion of a large meal.

Despite the lack of understanding of this disease’s aetiology and pathophysiological process, there are several common traits which appear to bind these cases as a definite but ill-understood entity and they include:

- A predominant occurrence in females (17 females out of 21 reported cases).
- Asian children being the most commonly affected (18 Asians out of 21 reported cases).
- The perforation is typically along the greater curvature of the stomach on its posterior wall (14 at greater curve, two (2) at lesser curve, one (1) at the body and four (4) not described).
- The rapid progression of the disease from onset of pain to its sudden perforation.⁴
- High morbidity and mortality despite aggressive treatment.⁴

CONCLUSION

Non-neonatal spontaneous rupture of the stomach is a very rare condition occurring predominantly in Asian girls. The median age range is between 2–5 years (16 out of 21 cases).

There is very rapid progression from gastric dilatation to sudden perforation. Once gastric rupture occurs, there is rapid clinical deterioration with severe metabolic disturbance, often resulting in death or neurological deficit.

Should one see massive gastric dilatation in a non-neonate, immediate gastric decompression, antibiotic therapy and a vigilant look-out for gastric perforation may reduce the morbidity and mortality of this rare disease.

REFERENCES

The Role of Arthroscopic Debridement in Osteoarthritis of the Knee: A Brief Review

Wan Hazmy Che Hon, MD, MSOrtho

ABSTRACT
Arthroscopic knee debridement for the treatment of degenerative arthritis is one of the commonest procedures done by orthopaedic surgeons following failure of conservative treatment with cartilage promoting supplements or intra-articular hyaluronic acid injection. Over the years it has become the subject of debate on the exact role and outcome of the procedure compared to the tremendous volume of procedures done especially in changing the natural history of the osteoarthritis self. With the introduction of the cell stimulating procedures such as stem cell therapy and protein rich platelets (PRP) the role of arthroscopic debridement has been further expanded, making it a hot topic for discussions amongst the proponents and opponents of the procedure. KPJ Medical Journal 2016; 6:54–56

Keywords: Degenerative arthritis, arthroscopy, debridement

INTRODUCTION
Arthroscopic knee debridement is one of the commonest procedures performed in patients with degenerative knee disease. It has been a popular procedure both for the patients and surgeons in order to delay total knee replacement. The rationale behind its effectiveness is probably partly through the removal or dilution of the enzymes that are part of the degenerative process of osteoarthritis, and partly by addressing the preexisting mechanical problem such as meniscal tears and loose bodies.

Despite its popularity, there has been little available information regarding the progress of the patients following the procedure. Arthroscopic surgeons who are in favour of this procedure feel that it is able to give adequate pain relief for the patient and a good alternative on delaying knee replacement surgery. On the other hand, some arthroplasty surgeons feel that the procedure is unnecessary and of little or insignificant short term benefit compared to knee replacement at the first instance.

Numerous studies have been conducted to evaluate the patterns of utilization of arthroscopic knee debridement for the treatment of degenerative arthritis. Most of the studies have divided the patients for the pre intervention and post intervention comparison into four groups based on the arthroscopic finding using Outerbridge grading system¹ (Stage I: Softening, II: Fibrillation, III: Fragmentation, IV: Eburation).

DISCUSSION
The role of arthroscopic debridement in degenerative arthritis of the knee should be focused into two important aspects, the relief of clinical symptoms and the ability to intervene or delay the progress of osteoarthritis. Critics have said that lavage and debridement do nothing to change the natural history of the disease and are not worth more than a placebo effect. Despite that, the placebo effect is well known in medicine, and if it does produce positive results in terms of reduction of symptoms, it cannot be entirely discounted.²

Over the years, high tibial osteotomy has been used successfully in early osteoarthritis involving the medial compartment. Even though it was found that fibrillated cartilage (Outerbridge III) has little potential for repair compared to the eburnated group (Outerbridge IV) after the correction of the mechanical axis, degeneration was significantly prevented.³ The complementary role of arthroscopic joint debridement to high tibial osteotomy has well been established. Mac Intosh et al found 82% good or satisfactory results in 120 patients followed-up to thirteen years.² Shultz et al performed a prospective study using PRP in high tibial osteotomy and found better results in the PRP group compared to the control group.⁴

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study on patient with medial gonarthrosis treated with high tibial osteotomy with and without arthroscopic debridement. They found that even though there was no great difference in clinical outcome after one year between them, those who underwent additional arthroscopic debridement showed a better cartilage regeneration which was thicker and more stable, both witnessed arthroscopically and by electron microscopy.5

Even though a combination of arthroscopic debridement and high tibial osteotomy could be an appealing alternative to total knee arthroplasty in the young patient,6 arthroscopic management of degenerative arthritis itself is an attractive alternative to osteotomy or total knee arthroplasty if predictable improvement and durable results can be achieved.

Success rates for arthroscopic partial meniscectomy and arthroscopic debridement vary between 50% and 75% 7,8 depending on many factors, including the age of the patient, degree of arthritis, activity level of the patient, limb alignment and the extent of follow up.

Arthroscopic debridement is the preferred procedure to abrasion arthroplasty.9,10

Wai et al in their study on a population 50 years of age and over found higher rates of early total knee arthroplasty and rates of utilization suggesting that arthroscopic debridement for the treatment of osteoarthritis of the knee may be over utilized in the elderly patient.11 On the other hand, Timothy et al found that arthroscopic debridement offered measurable relief for 63% of the studied population with mean age of 58.1 years over a mean follow up of 50.6 month.12

Krug et al in their retrospective study on 161 patients with average follow up of 40 months found that patients with severe articular cartilage lesions who had undergone articular lavage alone showed significantly poorer results. Furthermore, with the same stage of osteoarthritis younger patients showed better results than older patient. They found that almost every second patient suffering from grade 4 chondromalacia complained of recurrent pain one year postoperatively while one of every six patients received a knee joint prosthesis within the first year.13,14 On the other hand, Mc Ginley et al found that 67% of the patients who were candidates for total knee arthroplasty (TKA) but selected arthroscopy as a temporizing procedure did not have TKA at an average of 13.2 years follow up. Their Tegner Activity Score averaged 3.5 and patient satisfaction averaged 8.6 on a 0 to 10 scale.15

Kalunian et al in a multicenter randomized double blind, controlled trial on 90 patients with early osteoarthritis treated with arthroscopic irrigation found significant improvement in pain assessment at 12 months follow-up as measured by Western Ontario and Mc Master University (WOMAC) pain subscale and by visual analogue scale (VAS).16

Hardin SF in a retrospective study on 204 osteoarthritic knee debrided arthroscopically and followed up for a mean of 7.4 years concluded that patients with less deviated axes did better than those with large angulations and treated prior surgery predisposed to poorer results. Younger patients did better even though age is secondary in importance to angular deformity.17

Although long-term success is difficult to predict, certain patient variables have been associated with better outcomes such as normal limb alignment, history of mechanical symptoms, minimal radiographic signs of degeneration, and short duration of symptoms.18,19 Long-term, randomized prospective studies are needed to define the role of arthroscopic debridement further. Information needs to be obtained with strict criteria defining the severity of arthritis, level of activity, length of improvement, and subsequent surgery.20

Several studies have suggested additional indicators that may provide the answer to which extent the knee joint will benefit from the arthroscopic procedure. Bachmann et al found that magnetic resonance imaging (MRI) was in agreement with arthroscopy in 81% showing more degeneration but less tears of menisci than arthroscopy. MRI and arthroscopy also showed coherently that the degree of degenerative joint changes was significantly correlated to patient age or previous trauma. There was no correlation of degenerative disease to gender, weight, type, frequency and intensity of sports activity.21

Currently more interest has been put on several laboratory and clinical markers of the progress of osteoarthritis. It was found that the severity of the cartilage damage corresponds with matrix metalloproteinases (MMP) activity in the synovial fluid, that are responsible for collagen breakdown during physiologic cartilage turnover and pathologic destruction of the cartilage.22 Even the shape of wear particle, in particular the fractal dimension of the particle boundary was shown to correlate directly with the degree of osteoarthritis. This may also provide a reliable means for the assessment of the cartilage damage and repair after surgical or conservative treatment of osteoarthritis.23 However the practicability and cost effectiveness of doing MRI and other laboratory markers prior to arthroscopic debridement should first be justified.

Over the past several decades, much has been learned about articular cartilage and its physiological capacity to restore itself. Techniques such as perichondral and periosteal interposition grafts, autologous osteochondral transplant systems, autologous chondrocyte implantation and chondrogenic stimulating factors have been introduced and undergoing testing in order to achieve healing and restoration of articular tissue. To date, no technique has been completely successful in achieving exactly normal regenerative articular cartilage.2,24 If this can be achieved, the future will lie in the salvage of joints through arthroscopic procedures rather than the replacement of joints by arthroplasty.

Wan Hazmy et al25 conducted a retrospective study on 202 patients with degenerative arthritis of the knee who had their first arthroscopic debridement between
the years 1992 to 1995 and had a follow up of 5 years or more unless total knee replacement has been performed which represented the end point of the study. The patients were divided into 4 groups based on the first arthroscopic finding using Outerbridge grading system. Clinical status following the first arthroscopy and during the last follow-up were evaluated (Subgroup A: asymptomatic, B: partial improvement with recurrent symptoms and C: no improvement with continuous pain). The durations between the first arthroscopic debridement and TKR were also taken into account. Following the first arthroscopic debridement, 93.7% of patients in stage I and II became asymptomatic compared to 26.4% in stages III and IV where 60.4% still presented with recurrent symptoms. On the last follow up, 18.9% in stages I and II had total knee replacement done compared to 78.0% in stages III and IV. The average duration between the first arthroscopic debridement and TKR was 8.6 years in stage II, 3.3 years in stage III and 1.5 years in stage IV.

CONCLUSION

Numerous studies have been able to provide useful information both for the surgeon and more importantly for the patients so that they are well informed of the state of their osteoarthritic condition and the expectation following arthroscopic debridement of the knee. It is of utmost importance that the patients’ preoperative expectations have to be clearly objectified. Given the proper selection of patients and the correct stage of degenerative arthritis, arthroscopic debridement can still be a successful palliative, temporizing treatment for the osteoarthritic knee.

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The Permissibility of Judicially Prohibited and Impure Substances in Medicines

Musa Mohd Nordin, FRCP, FRCPCH, FAMM, Mohamed Fauzi Abdul Rani, FRCP, and Yuzaidi Yusoff

It looks like the porcine conundrum is making its rounds yet again. Suffice to begin the narrative by quoting a verse each from the Quran and the Hadiths (authentic traditions of the prophet) which sums up the compassionate and human nature of Islam.

Allah SWT says in the Quran;

"And strive for Allah with the striving due to Him. He has chosen you and has not placed upon you in the religion any difficulty."\(^1\)

And an authentic tradition narrated by Aisha (RA);

"If given an option between 2 actions, the Prophet (SAW) would surely choose the easier one, as long as it is not sinful."\(^2\)

And we firmly believe this spirit and approach pervades the corpus of the jurisprudence of facilitation (Fiqh Taysir). And at no point in time does it blemish the belief nor practise of the faithful because the scholars have anticipated these challenges of modernity and have reiterated;

"Allah will bless the believer who recognises and engages with the new world, yet remains true to his religious values."

History will testify that the Muslim scientists dominated virtually all aspects of knowledge and research from 600 – 1700 AD. Az-Zahrawi (930-1013 AD) the father of modern surgery was pioneering new surgical instrumentations when Europe was restricted by a religious edict in 1163 AD which instructed as follows;

"All forms of surgery must be stopped in all medical schools by all surgeons."

Is it any wonder that Martin Kramer, an American Historian wrote;

"Had there been Nobel Prizes in 1000, they would have gone almost exclusively to Muslims."

Somehow, the Muslims lost it along the way but the following hadith continues to inspire Muslims to catch up on lost ground and rejuvenate their quest for leadership in the sciences;

"A word of wisdom is the lost property of a Muslim. He should seize it wherever he finds it."\(^4\) It is in this vein that the contemporary Muslim scholar, Syakh Yusaf al-Qaradhawi has said to the effect;

"Two areas of human activities (muamalat) which requires cutting edge edicts (fatwa) are economics and medicine."

Hence, it is not surprising that the many Councils of Jurisprudence, all over the world, eg European Council of Fatwa & Research (ECFR) chaired by Syakh al-Qaradhawi, have deliberated profusely on the many issues related to medicine and biotechnology. These Councils like the ECFR were kept informed of the latest and best practices in medicine by regular meetings with the likes of the Islamic Organisation of Medical Sciences (IOMS) based in Kuwait.

To illustrate the “cutting edge fatwas” that emanated from IOMS, the issue of human cloning is a pertinent example. In 1983, whilst deliberating on issues related

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to In-Vitro Fertilisation (IVF), two papers were presented discussing the probability and permissibility of cloning humans. Then the science was at the level of cloning plants and marine life. Sixteen years later, Dolly the sheep was cloned in 1997 and the IOMS immediately updated their human cloning fatwa, whilst the scientific world were still bedazzled by this new science.

The issue of the use of substances of porcine origin in food and medicine is an archaic one. Nonetheless, the ECFR has comprehensively dealt with it, when deliberating the permissibility of the use of Oral Polio Vaccine (OPV) which is manufactured using porcine trypsin. This was published in their 11th Session of the ECFR held from 1-7 July 2003, in Stockholm.

The ECFR argued as follows:

a) What God forbids is the partaking of pork, and trypsin has nothing to do with pork

b) Even if we admit that trypsin is forbidden, the amount used in preparing the vaccine is negligible, if one applies the rule that “when the amount of water exceed 2 qillas (343 litres), impurities no longer affect it”

c) Supposing that trypsin is unclean, it is thoroughly filtered, that it leaves no traces whatsoever in the final vaccine

d) In case the three arguments forwarded are still insufficient, the haram (forbidden) is made permissible in cases of necessity.

In their concluding remarks they emphasized,

“The Council urges Muslim leaders and officials at Islamic Centres not to be too strict in such matters that are open to considered opinion and that bring considerable benefits to Muslim children, as long as these matters involve no conflict with any definite text.”

Such is the latitude of rationale and magnanimity of our religious scholars (fuqaha) in addressing the bigger picture of child health, child survival strategies and the advocacy of life saving vaccines.

In an even much earlier seminar in 1995, the Eastern Mediterranean Regional Office (EMRO) of the World Health Organisation in collaboration with IOMS deliberated on “The judicially prohibited and impure substances in foodstuffs and medicines.” This was attended by 112 religious scholars and medical experts.

Amongst others, the IOMS issued the following recommendation in relation to bio-transformation (istihalah);

“Transformation which means the conversion of a substance into another substance, different in characteristics, changes substances that are judicially impure, or are found in an impure environment, into pure substances, and changes substances that are prohibited into lawful and permissible substances.”

Accordingly IOMS added;

“The gelatin formed as a result of the transformation of the bones, skin and tendons of a judicially impure animal, is pure and judicially permissible to eat it.”

This is essentially back to basics biochemistry, whereby the gelatin through a process of hydrolysis is broken down to a mixture of individual amino acid which is not specific to any animal species. Bovine sources of animal collagen is specifically avoided based on safety reason to prevent the risk of Transmissible Spongiform Encephalopathy (TSE).

The regional director of EMRO wrote to all 22 countries and territories in the Middle East, the North Africa, the Horn of Africa and Central Asia the following instruction;

“In the light of the above (fatwa); you may wish to issue a statement that includes this legal opinion, in order to relieve all Muslims in the nation, whether adults or youths, men or women, from the embarrassment they feel when taking drug gelatinous capsules and similar gelatinous capsules as vitamins…”

We have learnt and read fatwas from religious scholars in Malaysia which unlike the ECFR and IOMS et al are individual-centric, random, ill-researched and anecdotal in nature. Their lack of grasp and understanding of the new science have made them ultra-conservative, restrictive and prohibitive in their religious edicts.

We have endeavoured to mainstream evidence based medicine (EBM) of the highest quality and which should henceforth dictate our best clinical practices. And importantly, it is sanctioned as Shari’ah compliant by the highest authorities of jurisprudential scholarship among Muslim scholars world-wide. This excellent collaboration of the best brains in medicine and jurisprudence has lightened the burden upon the Muslim Ummah (community). It has not only truly embraced the jurisprudence of facilitation (Fiqh Tayyir) but also the jurisprudence of priorities (Fiqh Awliyaat), realities (Fiqh Waqi’ah) and the jurisprudence of balance (Fiqh Wasatiyyah).

All of these are undertaken in response to the call of Allah in the Quran which reads;

“Allah commands doing justice, doing good to others…”

This is primarily the end point of the Maqasid as-Shari’ah (priorities of jurisprudence), which is the transformation towards justice and the preservation of public interest (maslahah ammah).

We urge the religious authorities to take cognisance of the invaluable heritage of medical fatwas that is before us and not attempt to reinvent the wheel. They should instead incorporate these shari’ah compliant best
clinical practise into the corpus of our nation’s jurisprudence in medicine.

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The Permissibility of Using Rotavirus Vaccines – Lessons from Oral Poliovirus Vaccines

Musa Mohd Nordin, FRCP, FRCPCH, FAMM

INTRODUCTION

Pneumonia and diarrheal disease are the two top killers of children. United Nations International Cultural and Educational Foundation (UNICEF) and World Health Organization (WHO) reports that these two diseases kill more than 2 million children each year. They make up 29% of childhood deaths under the age of 5 worldwide.1

Poor sanitation, insufficient water treatment systems, lack of access to appropriate medical care and lack of life-saving vaccines lead to an estimated 800,000 diarrheal deaths in children under five and millions more hospitalizations every year. While many pathogens can cause diarrhea, rotavirus is the leading cause of severe and fatal diarrhea in infants and young children. Virtually every child in the world would have been infected with the rotavirus (RV) by the age of three. Globally, rotavirus gastroenteritis kills 527,000 (475,000-580,000) children under five and is responsible for millions of hospitalizations and clinic visits each year (Fig. 1). Ninety-five percent of rotavirus deaths occur in developing countries in Africa and Asia.2

In the management of diarrhea, basic interventions include; encouraging infant breastfeeding, improving access to clean drinking water, zinc supplementation and oral rehydration solutions (ORS). However, the rotavirus is so contagious and resilient that these simple measures, so effective in curbing other diarrheal diseases, do not effectively eliminate it.3

Rotavirus Vaccines

First introduced in the US in July 2006, it reduced hospitalizations for severe rotavirus by a significant 58-86% over three years.4 Two years after the introduction of the vaccine in Queensland, Australia in July 2007, there was an 89-94% reduction in rotavirus-related hospitalizations in children under five years of age.5 Nicaragua was the first developing country to introduce the vaccine. The rotavirus vaccine was 60% effective in preventing severe RVGE.6

In June 2009, the Strategic Advisory Group of Experts (SAGE), supported by the evidence from these and other pivotal studies, recommended the global inclusion of RV vaccination into all national programs for all infants.7

The special supplement, “Rotavirus Vaccines for Children in Developing Countries,” to the journal Vaccine in April 2012, reaffirmed that RV vaccines are proven to be effective, safe, cost-effective and are lifesaving. Although the RV vaccine was relatively less efficacious in clinical trials in developing countries compared to US or Europe, the much higher burden of severe RVGE in developing countries would confer a much higher public health benefit with the inclusion of the vaccine.8

In Africa and Asia, where 95 percent of deaths are due to rotavirus occur, more than 2.4 million child deaths can be prevented by 2030 by increasing access to lifesaving rotavirus vaccines. Universal use of RV vaccines can avert 6 million clinical and hospital visits, thereby saving US$68 million annually in treatment costs.8

Islamic Jurisprudence

In the hierarchy of the goals of Islamic Jurisprudence (Maqasid al-Shari'ah); the preservation of life comes only second after the preservation of the Deen (religion). Life is a gift from Allah (SWT) and its protection and continuation is of utmost importance and urgency. The sanctity of human life is emphasized in the Quran “…and if anyone saved a life, it would be as if he saved the life of all mankind.”9

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The Prophet (may peace be upon Him) related, “We are a people who do not eat until we are hungry. And if we eat, we do not eat to our fill.” This narration, among others, is the backdrop to a powerful medical maxim “Prevention is better than cure.”

This medical aphorism is further reinforced by the jurisprudence principle; “sadd-ul-dhara’i’” – closing the doors to destruction or blocking the means of corruption.

These back to basics rulings alone are sufficient justification for the permissibility of immunizations to save the lives of innocent children, notwithstanding the issues related to the “halalness” of the vaccines. The question of “halalness” (permissibility) was raised because of the inclusion of the porcine enzyme trypsin in the manufacturing process of the two available RV vaccines namely Rotateq (MSD) and Rotarix (GSK). This has triggered some concern in the Muslim medical fraternity, the Fatwa Councils and by extension the lay public.

The 81st Conference of the Fatwa Committee National Council of Islamic Religious Affairs, Malaysia was held on March 31, 2006 and discussed the ruling of using a rotavirus vaccine that utilized porcine sources in its production process. The Committee decided that the usage of the rotavirus vaccine is not permitted based on the following three reasons:

1. There is no urgent need at the moment
2. There are alternative substances or medicines besides using pig sources in the production of the said vaccines
3. There is no concrete proof that people in the country are in dire need of such vaccine.

Trypsin is an enzyme that cleaves protein into smaller fractions. In the manufacture of the RV vaccine, trace amounts of trypsin is used to activate the virus and later to separate the virus from the cultured cells. Trypsin of porcine origin was preferred primarily based on a safety reason, being free of Transmissible Spongiform Encephalopathies. Through various steps of microfiltration, the trypsin was completely removed from the end-product. (Fig. 2)

This however is not a new issue because it has been previously addressed by Muslim physicians, scientists, public health experts who are at the cutting edge of vaccinology and child survival strategies as well as jurists (fuqaha) in relation to the use of the oral poliovirus vaccine (OPV).

The Oral Poliovirus Vaccine (OPV) which has led to the virtual global eradication of polio, utilizes a similar technology in its manufacturing process. It utilizes small, virtually negligible amounts of trypsin derived from porcine origin, to disconnect the contiguous cells in the tissue culture. At that time there was a significant fatwa from the European Council of Fatwa and Research (ECFR) which in 2003 opined that “Out of piety, some brother Muslims in various parts of the world, particularly in East Asia, have issued a fatwa that it is not permissible to administer this vaccine (OPV) to children, due to the fact that porcine trypsin is used in preparing it.”

The Council argued as follows:

a) What God forbids is the partaking of pork, and trypsin has nothing to do with pork
b) Even if we admit that trypsin is forbidden, the amount used in preparing the vaccine is

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**Fig. 1. Child rotavirus deaths by country**

<table>
<thead>
<tr>
<th>Country</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>India (21.8%)</td>
<td>98,621</td>
</tr>
<tr>
<td>Nigeria (30.8%)</td>
<td>41,057</td>
</tr>
<tr>
<td>Pakistan (39.5%)</td>
<td>39,144</td>
</tr>
<tr>
<td>Democratic Republic of the Congo</td>
<td>32,653</td>
</tr>
<tr>
<td>Ethiopia (52.9%)</td>
<td>28,218</td>
</tr>
<tr>
<td>Afghanistan (58.6%)</td>
<td>25,423</td>
</tr>
<tr>
<td>Uganda (60.9%)</td>
<td>10,637</td>
</tr>
<tr>
<td>Indonesia (63.1%)</td>
<td>9,970</td>
</tr>
<tr>
<td>Bangladesh (65.3%)</td>
<td>9,857</td>
</tr>
<tr>
<td>Angola (67.2%)</td>
<td>8,788</td>
</tr>
</tbody>
</table>

negligible, if one applies the rule that “when the amount of water exceed 2 qillas (343 litres), impurities no longer affect it”
c) Supposing that trypsin is unclean, it is thoroughly filtered, that it leaves no traces whatsoever in the final vaccine
d) In case the three arguments forwarded are still insufficient, the haram (forbidden) is made permissible in cases of necessity.

In their concluding remarks they emphasized, “The Council urges Muslim leaders and officials at Islamic Centers not to be too strict in such matters that are open to considered opinion and that bring considerable benefits to Muslim children, as long as these matters involve no conflict with any definite text.”

Such is the latitude of rationale and magnanimity of our scholars (fuqaha) in addressing the bigger picture of child survival strategies and the advocacy of life saving vaccines.

Global Advocacy for Polio Eradication

WHO Regional Office for the Eastern Mediterranean (EMRO) recently hosted a high-level consultation of Islamic scholars, from 6-7 March 2013, in the WHO Regional Office in Cairo. In its global efforts to eradicate polio, the consultation noted with much concern that this paralyzing and fatal disease remains endemic in three Muslim countries, namely Nigeria, Pakistan and Afghanistan. Up until 1 May 2013, there were 16, 6 and 2 cases of polio in the three countries respectively. There were no other reported cases elsewhere in the world.

The consultation unanimously reaffirmed that the polio vaccine is safe and does not contain any haram substance and emphasized the urgent need to rectify mis-conceptions about the polio vaccine and the global polio eradication program.

With the universal use of OPV this killer and paralyzing disease has been reduced by more than 99% to only 24 cases in 2013. The Federation of Islamic Medical Associations (FIMA) recently issued the Cairo Declaration for Polio Eradication on 28 February 2013. FIMA was also a signatory of the Scientific Declaration on Polio Eradication launched on 11 April 2013, joining hundreds of scientists and technical experts from 80 countries.

Since the manufacturing process of the two oral vaccines (OPV and RV) are similar, involving the use of minute amounts of trypsin which is later removed by ultra-filtration, the pivotal judicial edict of the permissibility of OPV can be similarly applied to the RV vaccine.
Towards Universal Mass Vaccination with Rotavirus Vaccines

RVGE continues to scourge our youngest and most vulnerable, killing more than 1,200 children under five each day. The human tragedy is that RVGE is a vaccine preventable disease and many of these deaths can be averted by universal mass vaccination with the RV vaccine. RV vaccination offers the best protection against severe rotavirus diarrhea, and have been shown to save lives in countries which have incorporated RV vaccines in their National Immunization Program (NIP).

About 50 countries in the world have introduced RV vaccination in their national and/or regional immunization program. Muslim countries which have included RV vaccination in their NIP include Morocco, Iraq, Bahrain, Qatar, Yemen, Saudi Arabia and Sudan. Muslim Pakistan and Nigeria are 2 of 5 countries which together contribute up to half of the global RV diarrheal deaths in the year 2008. Through funding from the GAVI Alliance, formerly the “Global Alliance for Vaccines and Immunization” Pakistan has recently introduced the RV vaccine as part of their NIP.

Rotavirus Gastroenteritis and Vaccination in Malaysia

The RV vaccine has been in use in Malaysia since 2006. Since it is not part of the Malaysian National Immunization Program (NIP), it is mainly utilized in the private health sector. The uptake of the RV vaccine is still very low. Less than 20% of the birth cohort in the private health sector. The uptake of the RV vaccine is still very low. Less than 20% of the birth cohort in the private medical facilities are immunized against RV.

A study of under-5 mortality in Malaysia in 2006 showed that there were 1,699 deaths. Deaths due to diarrhea was the number 3 cause of deaths, contributing 83 deaths (4.9%), after congenital anomalies (25.1%) and pneumonia deaths (9.2%). This is unacceptably high for a country moving towards a developed nation status. Many of the developed nations in Europe, US, Canada and Australia have included the RV vaccine in their NIP.

Discharge records from government hospitals showed that the cumulative risk of RV related disease by 5 years of age was 1 in 61 for hospitalizations and 1 in 37 for outpatient clinic visits. The out of pocket cost associated with RVGE admission was estimated at USD 226 (106-799) which was 26% of the studied household income. The mean parental day work loss associated with RVGE admission was 4.8 days. All of these data suggest that the burden of RV disease is considerable and would be a substantial drain on the nation’s health expenditure.

At present there are no other medicines or substances which can act as an alternative to the present two oral RV vaccines. These have been studied in virtually all regions of the world and proved to be effective, safe, cost-effective and are lifesaving.

It behoves Muslim healthcare providers as well as religious leaders to propagate this information especially its similarity with the polio vaccination program and work to increase the utilization of the RV vaccine generally and specifically its inclusion in the NIP of Malaysia.

CONCLUSION

Rotavirus is the leading cause of severe childhood diarrhea and fatalities from gastroenteritis. Ninety five percent of these deaths occur in developing countries in Africa and Asia. Integrated with a package of interventions that includes ORS, zinc, breastfeeding, nutrition, good sanitation and hygiene, rotavirus vaccination offers the best hope for preventing severe diarrheal disease, and could save nearly 2.4 million lives by 2030.

However, the use of minute amounts of porcine trypsin in the manufacturing process of both RV vaccines has raised concerns amongst some in the Muslim community about the permissibility of the vaccine.

Lessons can be learnt from a precedent, an earlier fatwa issued on the use of OPV which is similarly manufactured using trace amounts of porcine trypsin. The European Council of Fatwa and Research (ECFR) chaired by Dr Yusuf al-Qaradawi and consisting of numerous renowned scholars in the Muslim world, when allowing the use of OPV added that “the hesitation of some parents to have their children immunized with this vaccine (OPV) poses a risk to Muslim children alone. At the same time, it gives an unfavorable image which portrays Muslims as hindering a process that aims to eradicate, with God’s permission, the existence of this disease on earth once and for all. After all, this eradication cannot be complete while there is even one child on earth carrying the virus."

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Does Education Improve Fluid Compliance Among Haemodialysis Patients?

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ABSTRACT
Introduction: End stage renal disease patients undergoing haemodialysis treatment are often found to be non-compliant with their treatment regime, dialysis therapy, and fluid intake. Poor fluid compliance leads to hypertension and cardiovascular complications, contributing to increased mortality and morbidity among the haemodialysis population. Patient education is advocated to improve compliance.

Objectives: This study aims to 1) assess knowledge on fluid and salt control, 2) determine fluid compliance status and 3) evaluate the effectiveness of patient education on fluid compliance.

Methods: This is a longitudinal study, using a quasi-experimental, non-equivalent group design, which took place in five hospital-based dialysis centers on 291 patients. The study includes questionnaire survey, patient records review and educational intervention for the experimental group. The outcome measures were interdialytic weight gain (IDWG), rate of fluid adherence (RFA) and mean predialysis blood pressure (MPBP), which was assessed at first, third and 6 month post-intervention.

Results: Both experimental and control groups had no significant difference in mean total knowledge scores in the pre-intervention phase. The experimental group had higher odds of knowledge improvement (OR3.94, 95% CI 2.02-7.69) than the control group at post-intervention phase. The fluid compliance level improved from 27.6% to 52.2% post-interventional in the experimental group. There was also increase in IDWG and RFA compliance at 1-month, 3-month and 6-month post-interventionally. However, there were no significant difference in MPBP. The multivariate logistic model indicated that duration of dialysis therapy; number of concurrent disease and number of antihypertensive medication were significant predictors of RFA compliance improvement.

Conclusion: Educational intervention resulted in improved knowledge and fluid compliance among haemodialysis patients. Nurses played an important role in providing ongoing education and encouragement to patients on fluid restriction and weight control. A structured and scheduled monthly education program for long-term non-compliant patients are effective in promoting and sustaining fluid compliance.

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Nurses Job Satisfaction in a Hospital Setting

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ABSTRACT
Job satisfaction has been an important indicator of nurses’ performance in client care. An earlier related explorative qualitative study identifies that supportive work environment and feelings of empowerment were important components of nurses’ job satisfaction. A self-administered job satisfaction questionnaire was developed, based on the findings from a related qualitative research and was distributed to nurses who have been working in the hospital for a period of least a year.

Seventy five percent 75% of respondents returned their completed questionnaire. The majority of the sample populations were Malays (89%) followed by Indians (8.7%), Chinese (1.6%) and others (0.8%). More than half of respondents’ (61%) were between 20-30 years and most (79.5%) has a 1-5 years working experience.

The result shows 46.5% of the respondents has poor job satisfaction, 27.6% were within the average bracket, 21.3% good and 4.7% of the total respondents achieved very good level of job satisfaction. Overall it indicates that only 24.4% of the total number of respondents felt satisfied in doing their work. This study also identified that participants, demographics has no relationship to their level of job satisfaction

Prevalence of Work Related Musculoskeletal Disorder Among Port Workers: Quantitative Analysis at the Physiotherapy Centre of Malaysian Shipping Industry, Selangor

Mohd Izham, Shamsul Azhar, Mohd Azrul Anuar, Asrina Asri

ABSTRACT
Objective: To identify the type of occupational related musculoskeletal disorder among Malaysian Shipping Industry workers and to determine the relationship between workers socio-demographic factors with occupational related musculoskeletal disorder and injuries.

Method: This is a cross sectional, retrospective study, and using secondary data that is available at the physiotherapy center of Malaysia Shipping in Selangor. The study population is the shipping port workers received physiotherapy treatment from 2011 and 2012. The eligibility of study samples is diagnosed as occupational related musculoskeletal injuries or disorders and shipping port workers engage at the shipping industry in Selangor.

Results: A total of 90 samples comprise of 85 male workers and the remaining is female. The mean age is 34.1 (±7.36). Crane operator is the largest number of workers seeks for physiotherapy
ABSTRACT

Objective: The purpose of the study was to determine the sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) of post mortem CT scan (PMCT) in detecting liver and splenic injuries due to road traffic accidents.

Material: Sixty one road traffic accidental death cases underwent both post mortem CT scan and conventional autopsy. The imaging findings were compared to the conventional autopsy findings.

Results: The sensitivity, specificity, PPV and NPV for liver injuries in PMCT was 71%, 82%, 68% and 85% while that of splenic injuries was 73%, 80%, 35% and 90% respectively. The accuracy of PMCT was 79% for both liver and splenic injuries. There was strong association between lower left ribs fracture and splenic injury (p=0.005) and significant association between positive liver and splenic PMCT finding and intra-abdominal fatal injury (p=0.037)

Conclusion: PMCT has high specificity and negative predictive value for liver and splenic injuries, however the sensitivity and positive predictive values were low. The overall accuracy was not sufficient to enable PMCT to be used as a replacement for conventional autopsy, however it was a useful complementary examination and has potential to be used as decision making tool for selective internal autopsy.

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The Effect of Family Support Group Meeting on Psychological Symptoms Experienced by Family Members of ICU Patients

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ABSTRACT

Introduction: The sudden and unexpected admissions to an intensive care unit (ICU) can result in psychological symptoms to their family members. This study aimed to examine the effects of a Family Support Group Meeting (FSGM) on the psychological symptoms experienced by their family members with patients in ICU.

Methods: Quasi-experimental study involving an intervention and control group with pre-test and post-test design was used to investigate family members of ICU patients and psychological symptoms. The study was conducted among 56 family members involved structured FSGM on their experienced having family members in ICU. The psychological symptoms were measured using Hospital Anxiety and Depression Scale (HADS) for anxiety and depression symptoms and Impact of Event Scale-Revised (IES-R) for traumatic stress symptoms. Data was analysed using descriptive and inferential statistics.

Results and conclusion: The enrolled family members with mean ages 39.0 years (SD=8.03) in the intervention group and 41.9 years (SD=11.72) in the comparison group were from ICU patients with diverse ranges of diagnoses; trauma, medical and post-operative. The mean length of patients ICU stay was 7 days (SD=4.37) and 9 days (SD=5.62) in the intervention and the comparison group. The FSGM significantly showed reduction in...
the anxiety level t(25)=4.062, p<0.05, and depression symptoms t(25)=4.062, p<0.05. There is moderate level of traumatic stress symptoms after 1 week of patient’s hospitalization. or the mean length of hospitalization of the patient in the ICU were 13 days (SD=64.44) from the family members in the intervention groups and 17 days (SD=7.87) recruited from control group. The findings indicated that providing FSGM to family members of ICU patients had a significant influence on their psychological symptoms. This study supports the FSGM as method one to reduce the anxiety and depression symptoms of ICU family members. Further studies are needed to identify family member’s needs with a larger sample size.

Keywords: Family members, Family Support Group Meeting (FSGM), psychological symptom, anxiety, depression

Increased Endogenous Angiogenic Response and Hypoxia Inducible Factor (HIF) – 1alpha in Human Critical Limb Ischemia (CLI)


ABSTRACT

Background: The potent physiological endogenous angiogenic response to ischemic stimuli is often suboptimal and therefore, a better understanding of the basic mechanisms is essential for the use in therapeutic angiogenesis. Hypoxia inducible factor (HIF)-1alpha is a major transcription factor which promotes ischemia-driven angiogenesis. However, little is known about the endogenous angiogenic response and the role of HIF-1alpha in human critical limb ischemia (CLI). We aim to investigate the extent of angiogenic response and the expression of HIF-1alpha in the lower limbs of CLI patients.

Methods: Skeletal muscle biopsies were obtained from lower limbs (n=11) of patients with CLI and patients without limb ischemia as controls (n=11) with ethical committee approval. Microvessel density (MVD), using endothelial markers PAL-E, anti-CD31, anti-CD34; microvessel maturity, using pericyte marker anti alpha-smooth muscle actin (alpha-SMA); cell proliferation (Ki-67+ve) and HIF-1alpha expressions were determined by immunohistochemistry. MVD was measured as median number of microvessels in 200x magnification fields. 5 random fields per section and 3 sections per biopsy were analysed. Western blotting was used to quantify the HIF-1alpha expression. Western blotting was used to quantify the HIF-1alpha expression. Cell proliferation (Ki-67+ve) and HIF-1alpha expression was significantly increased in CLI and localised to endothelial cells, suggesting that HIF-1alpha plays a role in the endogenous angiogenic response in CLI but may be limited to endothelial cells. Therefore, in addition to augmenting the downstream pathways of HIF-1alpha, the role of pericytes should also be considered in therapeutic angiogenesis.

Results: The CLI group have significantly higher MVD. PAL-E staining for endothelium of capillaries and post capillary beds but not for endothelium of arteries or arterioles. In addition, there was no significant difference in the number of mature microvessels. The relatively low degree of cell proliferation may indicate that the angiogenic response is incomplete or inadequate to compensate for the degree of ischemia. These may explain the suboptimal nature of endogenous angiogenic response. HIF-1alpha expression is increased in CLI and is localised to endothelial cells, suggesting that HIF-1alpha plays a role in the endogenous angiogenic response in CLI but may be limited to endothelial cells. Therefore, in addition to augmenting the downstream pathways of HIF-1alpha, the role of pericytes should also be considered in therapeutic angiogenesis.

Contact Address: KPJ Damansara Specialist Hospital

Hannah Fong Siew Chin

ABSTRACT

Background: KPJ Tawakkal Specialist Hospital (KPJTS) has initiated lean management in August 2011 in order to improve the work processes. The lean core team was formed to work with direct support from Simpler Business System, United Kingdom. The core idea of lean is to maximize value for customers while using fewer resources and minimizing waste. Focus on the continuous improvement; improve workflow by eliminating waste related delays, workarounds and rework. The Lean methodology that were applied in this programs are 5 Lean principles, Value Stream Analysis (VSA), 8 wastes factor, A3 thinking, Hands off diagram, Lean cell, 6S and Rapid Improvement Event (RIE). The Womack and Jones’ 5 principles of Lean helps in identifying wastes, designing new processes with less wastes and proceeding with Rapid Improvement Event (RIE) which will be identified in Value Stream Analysis (VSA). The Value Stream Analysis (VSA) process breaks down all the steps of a process or pathway into individual elements and all the steps are examined to determine whether value is added to that particular step. This enables the wastes within the processes to be identified. The analysis is followed by rapid improvement events to implement the solution. The Rapid Improvement Event (RIE) will focus on one area or issue. The RIE identifies performance gaps, designs and implements the solution and implements for a process.

Aim: The Lean Healthcare in Operation Theater is aim: 1. To improve OT standard work processes. 2. To remove the non-value added activities (8 wastes) in patient’s surgical pathway.

Results: The OT current state summary of staff and surgeons satisfaction has increased from 20% to 85%. On the quality aspect, the trolleys Right First Time increase from 30% to 90% and the 6S scores in OT also increase from 12% to 95%. On the cost aspect, all OT utilization increased such as for OT 1 increase from 16% to 55.4%, OT 2 increased from 60% to 84.7%, OT 3 increased from 52% to 76.6% and OT 4 increased from 31% to 69.8%. The OT turnaround time was reduced from 45 minutes to 20 minutes and OT trolley set up time was also reduced from 7 minutes to 4 minutes.

Keywords: Lean, rapid improvement event, Operation Theater

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Competency in Nursing: The Role of Nursing Leaders

Paramjit Kaur

ABSTRACT

Objective: The objective is to study the role of Nurse Leaders in ensuring the competency among nurses to provide safe care and positive outcome in healthcare setting.
Method: Literature review of 30 studies on nursing Competency, leadership roles, competency education & assessment, quality and Safety in Nursing.

Results: Common themes were derived such as Structural empowerment, quality of care and organizational support and turnover intention. The studies also showed that there are many roles that nurse managers have to play when managing a unit, they have to be the role model for their nurses to emulate. They have to practice within the scope of professional standards, engage in collaborative practice, provide a supportive environment, manage equipment and resources, manage staffing levels, coordinate patient flow, and engage in complex decision making, interprets and disseminate organizational knowledge and engages in professional development. There is little difference among levels of management, suggesting that the nursing leadership workforce may experience a sudden and severe shortage within the next decade. Studies also shows that the impending retirement of a large proportion of the current cohort of nurse managers and the perceived unattractiveness of management jobs to staff nurses present a challenge to sustaining strong leadership in future nursing work environments and highlight a need to identify factors that promote retention of current nurse managers. Empowering leadership has played an important role in promoting retention of staff nurses. Core competency models guide strategic improvement programs addressing management practices and the effectiveness of organizational culture. Information about the level of professional role competency is essential to safe staffing. Data, together with knowledge of the patient population, technical skill, and experience create the equation that better defines who is best suited to be selected as the qualified professional for the staffing assignment.

Conclusion: Support from top management is essential, empowerment, selection of nurse leaders, Enhancement of leadership programme plays a vital role, mentoring, role modeling and role of Team leaders in each unit is important.

Measurement of competency levels were common in most studies as a large number of job-related or role-specific competencies have been created to assist with management development of Competency models have been subsequently developed across a number of industry sectors for specific jobs within the health professions, Including nursing.

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Interpersonal Communication Skills Among Pharmacy Assistant Students

Susheela Ismail

ABSTRACT

This study aims to analyse the interpersonal communication skills among pharmacy assistant in first year diploma in pharmacy. A total of 62 respondents participated in this study. A variable examined in this study is the interpersonal communication skills using survey research to collect data. This study used quantitative research method. Statistical analysis was performed using the Statistical Software Package SPSS to analysis descriptive data (frequency, percentage and mean) and inferential data (T-test). The statistical t-test analysis is used to determine the differences between demographic factors. The result showed that the levels of interpersonal communication skills are moderate; and there are no significant differences within demographic factors except English grade in SPM (Malaysian Certificate of Education). The finding also indicates that interpersonal skill proficiency among the pharmacy assistant student is only at average level.

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Effect of Trunk Rotation Exercise on Scoliosis in Post-Polio Residual Paralysis

Jibi Paul, Physiotherapy Lecturer

ABSTRACT

Aim and Objective: The objective of the study is to know the effectiveness of trunk flexion rotation, extension rotation and combined flexion rotation and extension rotation exercises in reduction of scoliosis. This study also aimed to compare and find out the best method of exercise to reduce scoliosis among post-polio residual paralysis.

Materials and Methods: Twenty five male scoliotic subjects secondary to post-polio residual paralysis were screened for the study. The subjects included with age group of 08-18years. The subjects selected with unilateral trunk and lower limb paralysis with Cobb’s angle of less than 30 degree. Materials used for the study were Rontgenograph, Protractor, Pencil and Scale to evaluate the Cobb’s angle. Purposive random sampling method used to select the subjects in each group of the study. The subjects were randomly divided in to three groups A, B and C with 8, 10 and 07 number of samples respectively. Each group A, B and C performed trunk flexion rotation, extension rotation and combined flexion rotation and extension rotation exercises respectively.

Subjects performed exercise regularly twice a day for five months under the supervision of the researcher. The subjects did exercise for one hour with one minute rest in between each movement. Cobb’s angle was measured before and after the treatment program for each subject.

Results: The group A with flexion rotation exercise, Group B with extension rotation exercise and Group C with combined flexion rotation and extension rotation exercises shown in reduction of scoliosis. The calculated t’ values 10.96, 9.49 and 6.15 for each group A, B and C respectively were greater than the table t value at 5% level and there for it was significant in reduction of angle of scoliosis among post-polio residual paralysis. The comparative study found that there was no significant reduction of scoliosis among the groups. F test performed between group A and group B could find that no significant variation with the calculated F value 1.796 which is lesser than the table F value 3.68 AT ν, 9 and ν, 7 at 5% level.

Independent t’ test performed between group A and group C also shown no significant variation with calculated t’ value 0.72 which is lesser than the table t value 1.71 at 5% level. Independent t’ test performed between group B and group C also shown no significant variation with calculated t’ value 0.79 which is lesser than the table t value 1.124 at 5% level.

Conclusion: Based on the statistical analysis performed it could find that all the groups undergone trunk rotation exercises have improvement in terms of reduction of scoliosis but there was no much difference between the groups on reduction of scoliosis.

Recommendation: Further studies could be conducted by combining the exercises with orthotic support which may attribute better improvement in reduction of scoliosis.

Keywords: Poliomyelitis, residual paralysis, scoliosis, Cobb’s angle, trunk rotation exercise
Public Perceptions Toward Nursing Profession in a Local Teaching Hospital

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ABSTRACT

Background: Nurses are the backbone of the healthcare team and today, much about nursing and its practice has changed, but many stereotypes still remain. Public perception is important and it affects the acceptance and recognition of the nursing profession.

Objective: The objective of this study was to identify the perception of public toward the nursing profession and to determine the factors influencing these perceptions.

Methods: This was a descriptive study. A convenience sample of a total of 100 people who attended the Out Patient Department (OPD) was recruited at a local teaching hospital. Self-administered questionnaires were given. The questionnaire consisted of three parts. Part A was demographic variables. Part B (Indiana tool) was adopted from May et al. (1988) to test on the public’s perception toward nursing profession, by measuring 18 parallel items on a five-point Likert Scale. Part C was related to professionalism, status and influencing factors. The result were analyzed using SPSS version 17.0.

Conclusion: Overall, the respondents had moderately positive perceptions toward nursing professionals. While nurses were commonly perceived as caring and respected, their role as leaders and decision making was viewed to be under-represented. Findings from this study have implications for the nursing practice, education and they support recommendation for future research. It is crucial to improve nursing image, instil positive public perception and increase of public awareness on some crucial distinctions that make nursing a unique discipline.

Keywords: Nursing image, public image of nursing, professionalism

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Transition from Transfemoral to Transradial Approach for Cardiac Catheterization in the first Cardiac Centre in Negeri Sembilan

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ABSTRACT

Aim/Objective: Transradial approach (TRA) for coronary angiography and intervention recently emerged as a safer mode of vascular access. The femoral artery used to be the standard approach for coronary procedures; however the radial approach has been increasingly used as an alternative to femoral access as it improved patient’s comfort and permits early ambulation. TRA also has reduced local vascular complication and resulting in shorter hospital stays. The aim of this study is to compare the trend of transradial and transfemoral approach in cardiac catheterization.

Methods: A retrospective, non-randomised study using data from the catheterization laboratory registry (ns=1467) between June 2007 until June 2014 was conducted. All patients who underwent diagnostic coronary angiography and percutaneous coronary intervention (PCI) were included. The patients had their procedure performed using radial (714 cases) or femoral (753 cases) vascular access.
cases) access and the trend was compared. All cases where TRA was converted to TFA was analysed.

**Results:** A total of 873 diagnostic coronary angiography and 594 PCIs were carried out. There was an increasing trend of TRA from 4.2% in 2007 to 85.1% in 2014. The transition from TFA to TRA for coronary angiography and percutaneous coronary intervention (PCI) occurred mainly in 2012. There were 26 cases of conversion from TRA to TFA from 2007 till 2014, but the conversion rate declined over the years.

**Conclusion:** Transradial coronary catheterization has proven to be safe, feasible and effective. In this study of 1467 cardiac catheterization patients over 7 years, an increased in transition of TFA to TRA was demonstrated and the transition occurred rapidly and safely with a reduction of TRA access failure.

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**Approach to Malignancies in the Pleura: A Tale of Two Biopsies**

**Sri Ganesh Kalimuthu**

**ABSTRACT**
Malignant involvement of the pleura by metastatic carcinoma is a common finding in a busy anatomic pathology practice. The pleura is a common anatomic site for metastatic involvement by primary lung cancer and in tumours of unknown origin. In poorly differentiated malignancies, the possibility of mesothelioma should also be excluded.

This is a case presentation of two pleural biopsies, designated Case 1 and Case 2 with malignancies exhibiting a sarcomatoid morphology. The nature of these two malignancies required the aid of immune-histochemistry in determining tumour histogenesis.

An extensive immune-histochemical panel comprising CK AE1/3, Calretinin, WT-1, EMA, E-cadherin, CD 56, CK 5/6 CEA was used in Case 1. Whereas Case 2 necessitated a panel of CK AE1/3, CK 7, CK 20, TTF-1, CDX2, WT-1, CA125, oestrogen and progesterone receptors. Case 1 was diagnosed as a mesothelioma and Case 2 was diagnosed as metastatic pulmonary carcinoma with sarcomatoid features.

These cases required a variation in the immunohistochemical panels. The choice of immunohistochemical panels were made in context with the clinical history, via interdisciplinary discussions with clinical teams in both cases. These cases highlight the importance of immunohistochemistry in the approach to poorly differentiated malignancies encountered in pleural biopsies. Whilst a vast panel of immunohistochemical antibodies are available in the investigation of pleural malignancies, multidisciplinary discussion is vital in elucidating patient history, in aiding the determination of specific immunohistochemical panels tailored to each case.

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FREE PAPER PRESENTATIONS

Effectiveness of Code Blue Team

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ABSTRACT

Background: Code blue team implementation in Malaysia is still considered a new practice. Recent emphasis on the effectiveness of code blue team has prompted many healthcare organizations to evaluate the effectiveness of code blue teams. Therefore, this study was conducted to evaluate the effectiveness of Code Blue Team in KPJ Kajang Specialist Hospital.

Objective: To assess the effectiveness of Code Blue Team in KPJ Kajang Specialist Hospital.

Methodology: The study was a descriptive study conducted in the acute care units of KPJ Kajang Specialist Hospital. The study population consisted of code blue team members. The data were collected using a structured questionnaire and observation tools. The data were analyzed using descriptive statistics.

Results: The findings of this study revealed that the Code Blue Team is effective in improving the outcomes of patients in emergency situations. The Code Blue Team effectively managed the code blue call and improved the clinical outcomes of patients.

Conclusion: The Code Blue Team in KPJ Kajang Specialist Hospital is effective in improving the outcomes of patients in emergency situations. The Code Blue Team is an essential component of the hospital’s emergency response system and should be incorporated into the hospital’s emergency preparedness plan.

Environmental Surface Cleaning Practices as Prevention Method of Nosocomial Infection in ICU and HDU, KPJ Selangor Specialist Hospital

Roslini Binti Sabar Malisi, Nurse Instructor, KPJ Selangor Specialist Hospital, Suzila Binti Kasnon

ABSTRACT

Background: Contaminated hospital surfaces play an important role in the transmission of dangerous pathogens. The triggering factor to perform the study is when 3 cases of Pseudomonas aeruginosa, 2 cases in urine sample and 1 case at Internal Jugular Catheter site found at the same location in 1 month continuously. Therefore, the purpose of this study is to determine whether cleaning of the ICU/HDU environmental surfaces is done properly, to find the sources of the infection and to prevent it from reoccurring.

Method: 2 types of sampling done. Air sampling were obtained using SAS Super 100 Air Sampler produces quantifiable results in relation to the volume of sampled air, establishing data on microbial levels in specific environments. With nominal air flow rate of 100 liters per minute, applications include clean room monitoring, air efficiency and indoor air quality. Second method, Swab Surface done randomly.

Result: From the monitoring carried out, with SAS Super 100 Air Sampler machine, 20 colonies found in the central of isolation room 1. Results of Swab Surface, 5 colonies of Pseudomonas spp and 4 colonies of Fungi found inside the sink, and more than 10 colonies found outside the sink of Isolation Room 1. 1 colony of Micrococcus found on the Isolation Room 1 wall. 4 colonies of Staphylococcus spp found on monitor and pendant.

Conclusion: Environmental surface cleaning is a fundamental principle of infection prevention in the healthcare settings. As healthcare providers, it is our responsibilities to prevent HCAI by adhering to infection control practices in daily practice.
Purpose of this study, Alerting Chain Care Bundle (ACCB) will make an engagement with current Fall Policy as a new initiative in preventing anticipated physiological fall.

**Methodology:** This study research intended engaged a mixed methods approach using both quantitative and qualitative research methods to elicit information regarding the patients fall. Triangulation techniques widely used in this research at the preliminary stage and ongoing been applied in other stages. A case study method will be applied throughout the implementation and evaluation phases.

**Result:** Expected result will be reduction of anticipated physiological through implementation of alerting chain care bundle with integration of Fall Policy, through continuous timely nursing rounds, Patient education and post fall assessment. Beside that teamwork, collaborations, right work environment, patient centred care will be enriched.

**Conclusion:** Patient centeredness is a common phrase in nursing and healthcare. Increasingly, there is an expectation on the principles of patient-centred. Using fall prevention efforts of ACCB determining the right thing to do at the right time and in the right way to prevent anticipate physiological and it befitted the high benchmark for the nursing forced.

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**Reduced Number of Phlebitis Incidents in KPJ Ampang Puteri Specialist Hospital through V.I.P Score Implementation**

Noraziah Binti Jemaat, State Registered Nurse, KPJ Ampang Puteri Specialist Hospital, Bachelor of Nursing (Hons).

**ABSTRACT**

The insertion of intravenous catheter has becomes the most common invasive procedure performed to patients in hospital. However, this procedure usually fails before the end of IV therapy due to irritation of the vein (phlebitis). In order to treat phlebitis related to intravenous catheter, the replacement is agreed as the most widely intervention used in occurrence of phlebitis.

The aim of this study is to reduce number of phlebitis incidents by implementing Visual Infusion Phlebitis (V.I.P) score in nursing care of intravenous infusion. Also, the study is to identify nurse’s compliance and phlebitis incidents rate among patients admitted in the medical and surgical ward in APSH.

This is an observational study conducted at medical and surgical ward of Ampang Puteri Specialist Hospital (APSH). Purposive sampling method was used to select the sample. Ninety respondents were involved in this study. Data was collected and been analysed by using PASW Version 19.0.

The results indicate that the incidents of phlebitis of patients in medical and surgical ward are reduce after V.I.P score applied in the nursing care of intravenous catheter. Analysis also shows that the number of phlebitis rate is decrease and at same time improved the nursing care for patient with intravenous catheter in line with the implementation of Visual Infusion Phlebitis score.

The findings in this study provide a basis of information towards the future planning in strategies of improvement of the nursing care and nursing education to the patients.

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**Importance of Pap Smear in Early Detection of Malignancy**

Muhammad Azraie Azeeyeez Abdul Malek, Cytotechnologist, KPJ Lablink Central, Sri Ganesh Kalimuthu, Consultant Histopathologist and Cytopathologist, KPJ Lablink

**ABSTRACT**

**Introduction:** A Pap test cannot reliably detect ovarian cancer. A Pap test is a procedure that involves collecting cells from your cervix and examining them under a microscope. A Pap test can detect cervical cancer and changes in your cervical cells that may increase your risk of cervical cancer in the future. Very rarely, ovarian cancer cells can be detected during a Pap test. If the ovarian cancer cells travel away from your ovaries through your fallopian tubes and uterus to the area around your cervix, the ovarian cancer cells could be collected during a Pap test. This is rare, so Pap test is not a reliable test for ovarian cancer but rare things do happen.

**Methods:** The pap smear show malignant cells but do not reminiscent either squamous or glandular origin. Later peritoneal fluid of the same patient was also sent to our laboratory. They show the same malignant cells as in the pap smear. Group discussion was called and we all agreed to proceed to cell block. An IHC panel was later done.

**Results:** This very case was discuss at CPC with clinicians. Upon further clinical discussion, the patient presented with significant peritoneal carcinomatosis. Current clinical differential was between a metastatic gastric carcinoma and a primary ovarian malignancy. However, ovaries were normal on radiological investigation. Gastric biopsy was done and did not show evidence of malignancy reducing possibility of a gastric primary. WT-1 and Ca125 positive favours ovarian primary. With WT-1 and P53 positive, specifically points towards high grade serous carcinoma like pointing towards ovarian primary.

**Conclusion:** Pap smear can function to detect secondary malignancies arising from extra cervical sites.

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**My hands were sweating, heart pounding, and my throat was dry and parched. Building up Confidence level of the First Year of Nursing Students’ Learning Needs in the Clinical Areas**

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**ABSTRACT**

**Introduction:** For most student nurses, the prospect of going out on placement for the first time is definitely one of the scariest. The transition from being a thus far purely-academic student nurse to being an oh my god they’re trusting me to go out into practice and look after real people with real ailments student nurse can be difficult to say the least. First day of students’ involvement in clinical area are often commented as a pathway for the students to face nursing task, constant remarks such as ‘that’s not the way to do things’ left the student with feeling of inadequacy and lack of self confidence in their skill. Studies shown nursing students need long term motivation, nurses as role models and the image of competent and intelligent attract them to appreciate the nursing profession and help others in the future.

**Aim:** The aim of the study to implement the Clinical Nursing Initiatives (CNI) to the First Year Diploma of Nursing students with the aim of improving their confidence level.

**Method:** This is an Action Research designed with mix methods of quantitative and qualitative approaches of data collection. Respondents will be graduates from the Diploma Nursing Students who experienced first time in the clinical areas. Instruments called Clinical Nursing Initiative, there are 5 stages of CNI programme.

**Stage 1:** The first day assessment for semester one year one nursing student on confidence level will be carried out through observation with checklist, Questionnaire, then plan the structured Orientation Programme for 14 days.

**Stage 2:** students are in the real clinical field, continue monitoring on the student confidence and competence for the whole 8 weeks of clinical placement.

End of the clinical placement for semester one year one, will be carried out with the evaluation using questionnaires and personal reflective diary/journal.
The Effectiveness of Hand Hygiene Knowledge and Practice Among Healthcare Workers at Kedah Medical Centre After Awareness Were Given

Rosnani Binti Abdul Razak and Noorhazamin Binti Hamid, Kedah Medical Centre

ABSTRACT
Introduction: Healthcare Associated Infection is on its increasing trend due to the physical contact with patients as well as the pathogenic organisms from patients colonized and infected by the environment. The hands of a person is a major contributor in the spreading of germs, especially from the healthcare workers. (Adelman, MM, 2007; FOH, E.2013).

Objective: The objective of this study is to determine the compliance rate of effectiveness of hand hygiene knowledge and practice among healthcare workers at Kedah Medical Centre after awareness were given.

Methodology: A quantitative descriptive design was used in this study. A cross sectional study was conducted in Kedah Medical Centre using self-administered questionnaire. The targeted population consisted of Allied health staff, trained and non-trained nursing staff.

Results: The study showed that 100% of the respondents had stated on knowing about hand hygiene; the purpose of hand hygiene, categories of hand hygiene, steps of hand hygiene and the 5 moments of hand hygiene; however there are still gaps in the knowledge and compliance towards hand hygiene. A majority of respondents are still not complying to the practice of hand hygiene after having contacts with patients surrounding.

Conclusion: The awareness given on the practice of hand hygiene is effective but that does not mean that there will be 100% of compliance towards the practice. This is due to the fact that the attitude and behaviour of the healthcare workers are still the main obstacle in achieving 100% of compliance in regards to the practice of hand hygiene. Continuous awareness and training will be given to all healthcare workers in order to achieve full compliance on the practice of hand hygiene.

Selective Breast Tumor Sampling for Biomarker Immunohistochemistry (Ihc) Analysis

Abdul Rahim Bin Yahaya, Medical Laboratory Technologist, LabLink Central, Sri Ganesh Kalimuthu, Consultant Histopathologist

ABSTRACT
Introduction: The utility of breast biomarker comprising oestrogen receptor (ER), progesterone receptor (PR), HER2/neu and Ki-67 is established in the prediction and treatment of breast tumors. At LabLink, we have instituted selective macroscopic sampling of breast tumors for the sole purpose of breast biomarker analysis which acts as an ancillary form of investigation in addition to the histopathology report.

Objective: Optimize the breast tumor biomarker expression through the better fixation via selective sampling of tumor at macroscopic examination.

Descriptions of Methods: The pathologist would macroscopically examine the breast excision specimen for the presence of tumor. Relevant tissue samples are taken for histological examination. The size of the selected tumor sample is standardized at 30mm x 30mm with a thickness of 5mm for breast biomarker analysis. This selected portion of the tumor is placed into a specific cassette inked orange in order to distinguish it from the routine histological sections. The tissue cassette sample analysis is fixed in formalin within 6–48 hours. Upon fixation, the paraffin embedded tissue block is sectioned for production of paraffin tissue slices for breast biomarker analysis.

Summary of Results: The resultant breast biomarker is for the cohort of cases was compared with cases which had not utilized this sampling method. The breast biomarker analysis showed more optimal tumor fixation, more specific nuclear and membranous immunohistochemical expression pattern for the relevant breast biomarkers.

Conclusions: The utilization of selected breast tumors sampling at macroscopic for breast biomarker studies is a valid method in producing reliable and optimal breast biomarker results.
**Improve Swab Counting Efficency Through Innovation**

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**BACKGROUND**

Unintended retained objects are considered a preventable occurrence, and careful counting and documentation can significantly reduce, if not eliminate these incidents. A count must be undertaken for all procedures where countable objects (e.g. swabs, instruments, sharps) are used. Peanut swabs or ‘Lahey’ swabs is a small round gauze used for blunt dissection or to absorb fluid in delicate procedures. Consideration should be given when using small round gauze; which is more likely to be misplaced or miscounted.

In 2009, Wan et. al.[1] estimated that retained foreign bodies occurred as infrequently as 1 in 5,500 operations. In a review of the characteristics of retained objects, Cima R. et. al. [2], sponges responsible for 68% of the retained foreign objects and in 62% of cases the counts have been recorded as correct.

Therefore, ‘Lahey’ swab holder is designed to facilitate perioperative practitioners to perform ‘Lahey’ swab count during surgery.

**General Objective**

To ensure correct Lahey swabs count during surgery.

**Specific Objective**

1. To quantify mistake count during surgery before using ‘Lahey’ swabs holder
2. To quantify mistake count during surgery after using ‘Lahey’ swabs holder
3. To analyse mistake reduction after using ‘Lahey’ swab holder.
4. To analyse scrub nurses confident using ‘Lahey’ swab holder.

**Methodology**

1. Selection criteria for case study as follows:
   i. Emergency surgery.
   ii. Surgery that involve open up abdominal cavity.
   iii. Surgery that use big incision.
   iv. Long surgery.
2. Patient will be position similar according to surgery requirement.
3. Similar instruments used specifically for the surgery.
4. In this study we use ‘Lahey’ swabs holder.
5. Counting procedure is performed by the scrub personal and witness by the circulator nurse according to the standard operating procedure for surgical count throughout the surgery.

**Summary:** These studies have been carried out from January to December 2014 and total of 81 cases have been analysed throughout the year. Study found that by using ‘Lahey’ swabs holder; inaccuracy of count during surgery decreased from 20% to 0%. It highlights points to be considered when implementing new count policies.

From the survey and evaluation conducted, the operation theatre nurses are more confident in handling small ‘Lahey’ swabs during surgery. They also verbalised that the innovation is a good tool in ensuring correct counts and it made the process easier as it is clearly visualised.

The others benefit, we can also save the time in each counting time process from 3 minutes to 10 seconds because of the reduction in mistake count after using the ‘Lahey’ swab holder.

**Conclusion:** With simple innovation of ‘Lahey’ swabs holder in counting small ‘Lahey’ swabs; we discover another unremarkable method to eliminate one of the source of retained foreign body for surgical patients.

**References:**


**Improved Compliance to Shelf Life of Multiple Use Medication through Implementation of Shelf Life Tag**

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**ABSTRACT**

Problems associated to medications are vital issues to be addressed among healthcare institutions and professionals as it results in significant impact to patient safety and cost. Increased number of medications related incidence, drug expiry, and misinterpretation of drug information particularly in multiple use drugs observed in KPJ APSH has led to initiation of Shelf Life Tag (S.L.T) invention to overcome the non-compliance issues related to Medication Management and Use and International Patient Safety Goal.

The study aimed to identify factors that contributes towards non-compliance in multiple drug usage and reduced medication related incidence by providing comprehensive data labelling system for drugs.

Retrospective data on medication related incidents and complaints in 2013 was analyzed on factors contributing to the non compliance. Questionnaire was distributed to staff in January 2014 to identify current factors leading to non compliance. S.L.T was designed according to the factors identified and distributed for usage in respective services beginning May 2014. Post implementation of S.L.T was evaluated based on number of medication-related complaints and survey forms. Incidents and complaints from June to December 2014 were compared to 2013 of the same period to evaluate effectiveness. Survey form was distributed to receive feedback for further improvement.

The implementation of has managed S.L.T to reduced number of medication error by 66.7% and medication related complaints by 78.9%.

The S.L.T application in KPJ APSH has successfully served as an alert system on expiry dates of multiple use drugs which resulting in reduced number of medication error and medication related complaints.
Nucleolar Size as Reliable Cytomorphological Indicator of Malignant Cells in Pleural and Peritoneal Effusion

Siti Zulaikha Md Daud, Cytotechnologist, KPJ Lablink Central, Sri Ganesh Kalimuthu, Consultant Histopathologist and Cytopathologist, KPJ Lablink

ABSTRACT

Introduction: In cytological diagnosis of pleural and peritoneal effusions, the assessment of morphological features plays an important part due to their pleomorphic nature. It is important to recognize the variation in appearance of benign mesothelial cells as well as in reactive changes to aid in identification of malignant cells.

Aim: In this study, nucleolar size of benign versus malignant cells in pleural and peritoneal cytology was compared to assess its reliability as a morphological indicator of malignancy.

Methods: From 2014, about 20 cases of effusions cytologies were reviewed. The nucleolar sizes of individual cells were compared between cytologically benign and malignant cells within the processed cytological material. Nuclear parameters were calculated using Motic Image plus 2.0 software.

Results: In the twenty cases reviewed, noticeable and significant increase in nucleolus size in comparison to the reactive mesothelial cells component was noted. The mesothelial cells exhibited smaller, more peripherally located nucleoli, whereas the cytological malignant cells possessed larger centrally located nucleoli. Significant differences were observed between benign and malignant effusion in nucleoli size.

Conclusion: In summary nucleolar size can act as a reliable morphological indicator of malignancy. This cytomorphological feature should be considered in the assessment of peritoneal and pleural fluid cytology. There are the observations from pilot study which we infer to further expand upon the strength of our current findings.

Nurses Knowledge and Practice Towards Care and Maintenance of Peripheral Intravenous Cannulation in KPJ Sentosa Medical Centre

Introduction: Insertion of peripheral intravenous catheter is one of the most common invasive procedures performed in hospitals, to receive therapeutic IV medication (Wilson, 2006).

Even though Peripheral intravenous catheter is common procedure, according to Arbaee, I.F (2012), there are still some nurses do not know about the procedure.

Objective
1. To measure the knowledge among nurses towards care and maintenance of peripheral intravenous cannulation.
2. To collect data on the practice of nurses towards insertion, removing and care and maintenance of intravenous cannulation.

Methodology
Research Design: The research design is a quantitative study. Questionnaire comprised demographic data, knowledge, practice, care and maintenance of peripheral intravenous cannulation.

Samples: Survey questionnaires distributed randomly to 91 nurses from various services.

Results: Demographic data revealed that majority respondents having clinical experience within 1-5 (61%). On knowledge towards care and maintenance revealed 94% of respondents aware on IV cannula to be replaced after 72 hours. 85% of respondents aware that National guidelines recommend IV cannula can be used 48-72 hours if no signs of complication. Practice on care and maintenance of IV cannula, shows 36% of respondents always change IV cannula after 72 hours.

Conclusion: The study revealed that, knowledge and practice on caring and maintaining IV cannula greatly influenced by years of experience. Nurses must be knowledgeable to avoid complications. Continuous Nursing Education on the National guideline on IV cannulation scheduled to enhance their knowledge and confidence level. Second survey is scheduled following the completion of training in October 2015.

Magic Ruler, An Invention of Mammographic Localization Devices to Locate Non-Physical Mass in Spot Compression View

Raduan NF, Mat Zin MS, Diagnostic Imaging Services, KPJ Penang Specialist Hospital

Introduction: Various techniques were used to locate the mass such as using fingers, rulers or self-estimation based on radiograph image. So far no specific tools being used to measure the location of mass. Inaccuracy of mass localization will affect the result of mammogram’s findings.

Objective Of The Invention: The ineffectiveness of the process has led us to form a team to innovate “Magic Ruler”; a specific tool to measure exact location of SCV of 2D’s mammogram image and able to measure in 2 different angles.

The purpose of invention is to avoid wrong location to be viewed at the spot compression mammography which will cause wrong diagnosis of the mammography.

Methods Of The Invention: The ‘magic ruler’ is an L-shaped plastic ruler with an adjustable pointer.

Magic ruler is used to measure the location of mass on the mammogram image. The same magic ruler with the measurement obtained will be put on patient breast to mark the actual location of the mass.

Using special plate for spot compression view, breast that had been marked will be placed on the centre of collimation. Image will be taking to confirm the finding and to detect the present of abnormal growth.

Results & Conclusions: After the implementation of magic ruler for a period of 6 months, recollection of data has been done and found that number of repetition had been reduced from 25 cases to nil.

By implementing the new project, Diagnostic Imaging Services was able to reduce retaking of mammogram (SCV) image and also maintain rate of retake within the National Limit below 3%, reduce patients’ exposure to radiation and safe cost for the hospital.

References:
Book references:

Website references:
**Re-Engineering of Green Zone Patient Flow in A&E Unit**

Azian Mahmud, Unit Manager, KPJ Selangor Specialist Hospital, Sumaria Abd Moin

**ABSTRACT**

**Background:** Emergency Services overcrowding has become a national problem and it is truly a health system issue. Emergency Services is a measure of health system performance and the monitoring of overcrowding should be part of a focus on measurement of quality in healthcare. This study was done to determine the incidences, causes and effects of overcrowding in emergency services in KPJ Selangor and also to identify the most probity solution to reduce the incidences of overcrowding in Emergency Services.

**Method:** Close ended question was distributed randomly to 100 patients in green zone. Result analyzed and cause identified. Counter measures listed based on contributing factors identified. Counter measures for implementation identified based on discussion and management approval. New location of green zone identified and the green zone patients was located in the identified area during peak hours from 6.00pm till 11.00pm. Post implementation survey was conducted to 100 patients in green zone. Data analyzed and comparison done.

**Result:** From the data collected, we have identified that space constrain in A&E waiting area is one of the contributing factor to patients dissatisfaction and staffs stress. After implementation of a few counter measures, we found that there are reduction of customer complaint, and reduce in staff stress.

**Conclusion:** Many factors contribute to Emergency Services overcrowding. Poor medical outcome, miss triage, delay in treatment and long waiting time may occur because of overcrowding. All this issue will lead to patient dissatisfaction and staff stress. Ability of an organization to provide a more conducive environment and effective work flow give a major impact on the customer satisfaction rate and hospital performance.

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**The effectiveness of the Fistula Clamp, in Arresting Fistula Bleeding of the Haemodialysis Patients in KPJ Sentosa Medical Centre**

Rosmasni Rasdi, Unit Manager, KPJ Kajang Specialist Hospital, Shammni A/P K. Viramuthu, Ramilah Begam binti Abd Aziz, Abdul Aziz bin Muhamad

**ABSTRACT**

**Introduction:** On completing haemodialysis, the needles are removed, and the patient is asked to apply pressure to induce clotting. As the patient’s holding fingers tends to quiver or cramp, a mechanical fistula clamp is used which saves the patient the ordeal of holding the needle holes.

The fistula clamp is constructed of durable plastic and stainless steel spring which does not rust and it generates 1-1.5lbs. It is designed to cradle the patient’s arm, without pinching and provide consistent pressure to the fistula after dialysis treatment. It is easy to use, and maintained.

**Objective**

1. To ascertain whether fistula clamp will arrest and stop the bleeding from the fistula site.
2. To reduces complication such as anemia.
3. To determine is there reduction of complaints and increase satisfaction.

**Methodology**

**Research Design:** This study took place at KPJ Sentosa Medical Centre’s Hemodialysis Services with a total number of 57 patients, in which the researcher used observational research design whereby 2 cohorts’ studies were used. For Cohort 1, 28 patients, bleeding was arrested manually whilst for Cohort 2, 29 patients used fistula clamps.

**Result:** From October 2014 till March 2015, data was collected for time taken in arresting the bleeding within 10 minutes. For Cohort 2 patients, the bleeding was arrested within the stipulated time.

**Conclusion:** The study revealed that the fistula clamp in effective hemostasis after needle removal. It is lightweight, safe, effective, affordable and not cumbersome. Thus when dialysis is completed and needle is removed a pad of gauze is placed over the needle hole and the clamp holds the gauze until the blood coagulates.

**To Improve Dialysis Treatment by Reducing Patients’ Waiting Time Through Lean Management in Haemodialysis Services of KPJ Kajang**

Romasni Rasdi, Unit Manager, KPJ Kajang Specialist Hospital, Shammni A/P K. Viramuthu, Ramilah Begam binti Abd Aziz, Abdul Aziz bin Muhamad

**ABSTRACT**

**Introduction:** Haemodialysis treatment is the most common method used to treat permanent kidney failure. With increase number of patients, Haemodialysis service is experiencing and increase in time demand and work process. Lean management facilitates in designing, improving and managing the current processes. The problem was recognized when the flow process of haemodialysis is not systematically tackled during changed over process. 4 elements of non-value added identified which is waiting, defect, motion and inventory.

**Objective:** To improve efficiency of dialysis treatment by eliminating non value added process in managing dialysis patients.

**Methodology:** There are three patient shifts in a day. Time for dialysis is based on staggered schedule given a day earlier which patient were advised to follow accordingly. Pre assessment including observation and weighing of the patient were done before patient is located appropriately using bay numbering system and not on any preferred bay. Late comers will be allocated to the next schedule. Staff assigned for priming will continue either priming or needling with the next patient. This process continues for all patients for that particular shift.

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The consumable trolley is arranged according to priority of medical item requirements. 

**Result:** Improvement in change over time, less waiting time, systematic and efficient way of working through a standard work of practice.

**Conclusion:** Lean management has improved on internal process by elimination of non-value added process through reduce patients waiting time.

**References:**

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**Pulse Oximetry as a Fifth Pediatric Vital Sign**

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**ABSTRACT**

**Introduction:** Children admitted to the ward or seen in the Accident & Emergency (A&E) routinely have a set of vital signs taken including temperature, pulse, respiration and blood pressure as an initial paediatric assessment. Children with pulmonary diseases such as viral respiratory tract infections, pneumonia, asthma, and bronchiolitis were most likely to have abnormal pulse oximetry values. Pulse oximetry accurately measure normal SPO2 and reliably detects desaturation under a variety of condition.

**Objective:** To evaluate the use of pulse oximetry as a routine 5th vital sign and its impact on patient management by the attending paediatrician.

**Method:** A prospective study which routinely screened children who presented to the A&E department with pulse oximetry.

**Results:** A total of 100 children presented to the A&E department during the study period. 2 (2%) patients bypassed triage to undergo immediate assessment & resuscitation. Triage nurses were able to measure respiratory rates and SpO2 accurately for 98 (98%) children. A total of 42 patients had SpO2 values of less than 95%. The attending Paediatrician upon being informed of the SpO2 readings, were noted to request additional chest radiographs, blood count test and ordered supplemental oxygen and antibiotics.

**Conclusion:** Our study shows that nurses may fail to recognize moderate oxygen desaturation in a small proportion of children, and with routine pulse oximetry measurements may result in significant changes in medical treatment.

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**Influenza Vaccination Uptake at KPJ DSH: The Impact of Pushing the Vaccine Trolley**

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**ABSTRACT**

**Introduction:** KPJ Damansara Specialist Hospital (KPJ DSH) offered influenza vaccination to its staff since 2012. This is to protect all the staff especially the front lines from either acquiring or disseminating the influenza virus. Despite several awareness and health talks, the uptake of the influenza vaccine among the healthcare workers (HCW) remained low. Various strategies were undertaken by the Infection Control services to increase the uptake of influenza vaccination among our HCW.

**Objective:** To increase the uptake of influenza vaccination among HCW in KPJ DSH.

**Method:** The total number of staff in KPJ DSH as at December 2014 was 638. Started in 2012 the infection control services encouraged all HCW to immunise against influenza annually. Due to poor uptake of the vaccine, the infection control services began an initiative to push the influenza vaccine trolley to all services and vaccinated the staff at their respective departments, doctors and consultants included.

**Results:** The influenza vaccine uptake among the HCW in KPJ DSH rose from 64% in 2012 to 72% in 2013 and spilled to 94% in 2014.

**Conclusion:** Our study shows the impact of pushing a trolley for influenza vaccination by the infection control nurse and infection link nurse. There is no plausible reason for HCWs to be excused influenza vaccination.

**Key words:** Influenza, vaccination, healthcare workers